Mark 7® 650 X & PRO Autodrive

User Manual

V 2.7

⚠	**Read this manual and the Dillon Precision Manual completely. Understand all safety and operating instructions. Failure to comply with the warnings and instructions may result in serious injury, illness or death.**

Table of Contents

Important Safety Instructions

Read this manual completely prior to installation and operation. Understand all safety and operating instructions. Failure to comply with the WARNINGS and instructions may result in serious injury or death. WARNINGS throughout this manual will be symbolized by the yellow WARNING symbols seen below.

WARNING – Activities using the Mark 7® 650 Autodrive are inherently dangerous and may lead to injury and even death. Actions as a result of using the Mark 7® product are solely the responsibility of the user – if you get injured through the reloading process or through the use of ammunition as a result of the reloading process it is your fault.

WARNING – Mark 7® equipment should only be operated by trained personnel that follow all safety precautions. Failure to do so could result in serious injury or death.

This product is designed to be used by reloading personnel in conjunction only with a fully functioning and well lubricated Dillon 650 reloading press. Its use should be limited to experienced personnel only. All personnel using this equipment are assumed to have prior experience setting up and operating a Dillon 650 reloading press. This document contains basic operating and maintenance instructions only.

WARNING - Never leave your Mark 7® Autodrive unattended while it is operating.

WARNING – Never run the Mark 7® Autodrive without the crank shield fully attached.

WARNING – Never operate the Mark 7® Autodrive if it is out of factory specification.

WARNING – Never operate the Mark 7® Autodrive unless it is completely within Dillon Precision factory specifications and is operating within factory parameters. This includes the shell plate locating pins and other machine-specific features. Read and understand the latest Dillon Precision 650 manual for your make and model machine and ensure that you fully understand the Dillon directions.

WARNING – Never operate the Mark 7® Autodrive with any third party accessories that substantially change the operation of the Mark 7® Autodrive

WARNING – Never operate the Mark 7® Autodrive while impaired.

WARNING – Never operate that Mark 7® Autodrive without using high quality brass and always use sufficient lubrication on your brass while operating the Mark 7® Autodrive.

WARNING – the Mark 7® Autodrive is designed to help automate the process of loading and processing of ammunition. Never operate the Mark 7® Autodrive at speeds higher than you have tested and are comfortable with for the type of reloading or processing that you are undertaking. Run the Mark 7® Autodrive at the slowest possible setting to create quality ammunition.

WARNING – Always wear protective clothing and eyewear. Flying debris may result when using this equipment. It is the responsibility of the user to ensure that appropriate protective clothing and equipment are used to provide protection from those hazards to which personnel are exposed or could be exposed while working with this product. Failure to do so could result in serious injury or death.

Box Contents

Please review these contents and inform us right away if you appear to be missing any of these items:

Main: Mark 7® 650 AutoDrive Assembly (1 item)

Middle Insert: (11 items)

- Tablet
- AC Power Cable
- Tablet Holder Mount
- Tablet Holder Clamp
- Crank Shield
- Optical Decapping Sensor™
- EMI Filter Kit for Bullet and Case Feeder
- Micro-USB Cable for Tablet
- Cable Management Zip Ties
- Mounting Hardware and Knuckle
- MicroSD Card: for software updates

Figure 1: 650 Main Assembly

Figure 2: Box Contents Included with Machine

Set-Up Procedures

The Mark 7® 650 Autodrive is manufactured with superior craftsmanship, quality materials and is backed by a factory warranty.

WARNING – Only use Mark 7® accessories with the Mark 7® Autodrive. Mark 7® equipment is prepared and tested by Mark 7® prior to delivery. To place the equipment into service, please review the following instructions carefully. In order to ensure proper operation and avoid damage to your press perform the pre-installation steps.

Prior to installation perform the following manual press checks and adjustments (see Dillon Precision XL 650 Manual for location of some of the items below):

1. Ensure that the press/autodrive combination is on a very solid surface that does not move. The Mark 7® autodrive is designed to sit on the 4 rubber feet in the corners, but it can also be directly bolted to your work bench by removing the 4X rubber feet in the corners. Use ¼-20 bolts to fasten the baseplate to the work surface from underneath. Small vibrations can have an unpredictable impact on the operation of the machine. Ensure that the machine does not move whatsoever when operating.

2. Always have your loader properly grounded to a high-quality grounding line.

3. Ensure that the press operates according to Dillon Precision specifications before you install the autodrive**. Any modifications to your machine outside of the Dillon standard configuration and parameters will void the Mark 7® warranty.** Ensure that the shell plate retaining shoulder bolt is adjusted so that the shell plate turns freely but is not too loose. Ensure that the index ring pawl enables the shell plate to move completely from one index position to the next. Verify that the 650 shell plate is aligned with the tool head using the 650 alignment pin.

4. Check that there is no powder or other debris under the shell plate. Lubricate the press as described in the Dillon Precision user's manual. Keep the shell plate clean.

5. There will likely be three (3) cables coming from the machine: the power to the case feeder, bullet feeder, and autodrive. **For best performance we recommend to keep the case feeder and Mr.Bulletfeeder cables separated from our system cables if possible.**

1. 650 Autodrive Component Identification

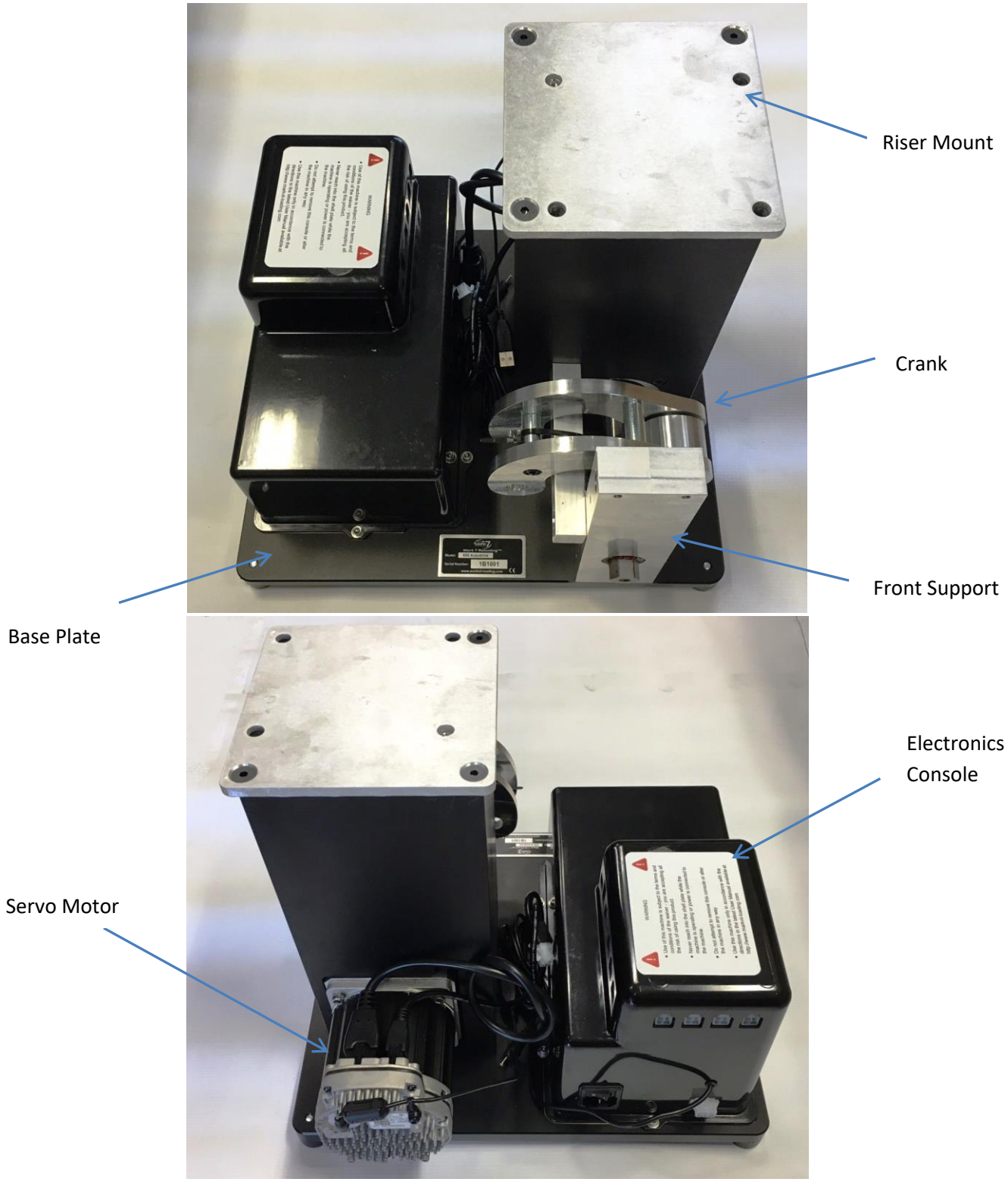


Figure 3: 650 Base Unit Front and Rear View

2. Removing 650 handle

Using a 7/8” wrench and a pin to lock the rotation of the handle remove the lock nut on the bottom of the handle as shown below. Depending on the age of the 650 press it may be required to punch out the handle out of the 650 knuckle.

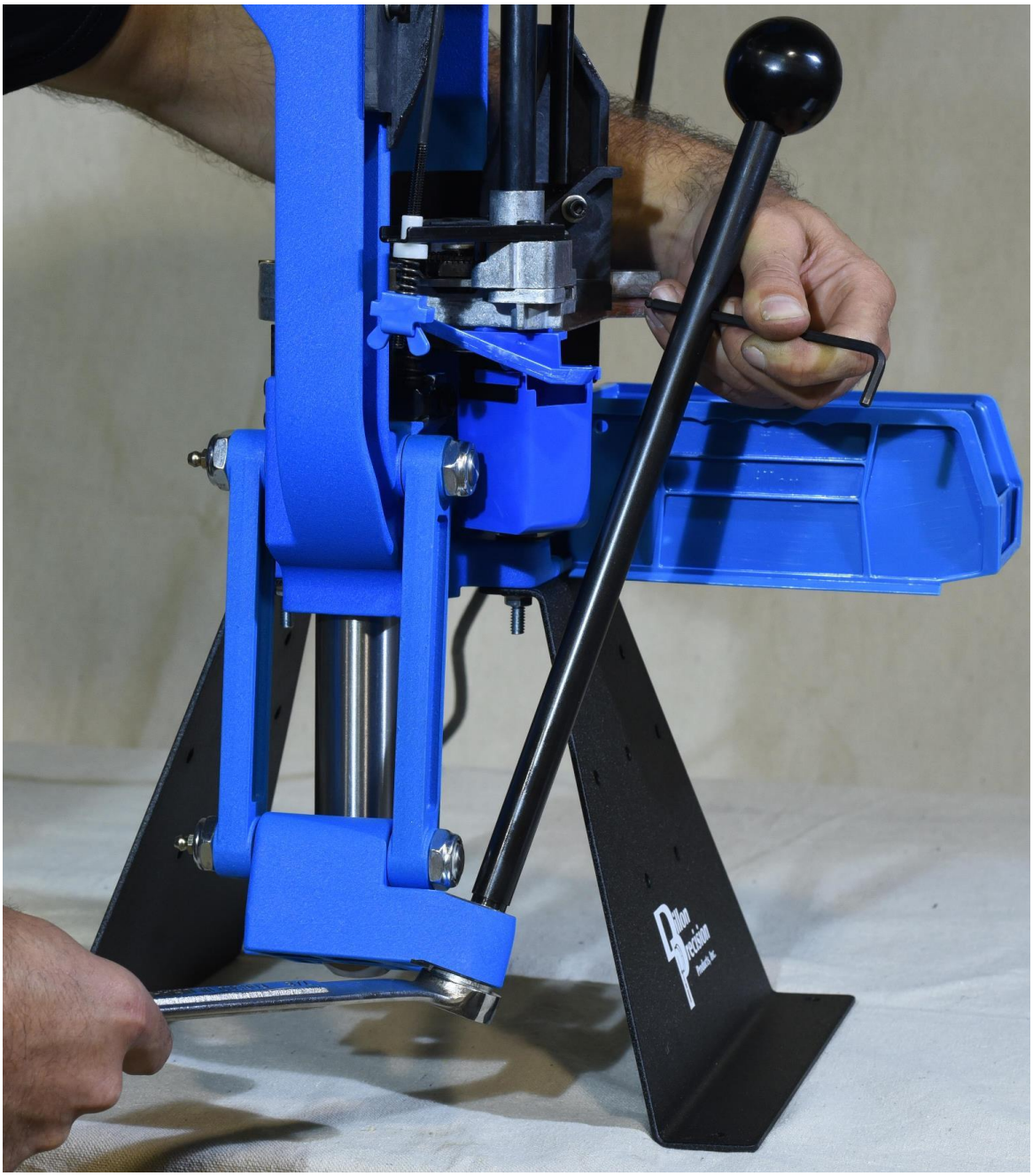


Figure 4: Removing 650 Handle

3. Removing 650 Knuckle and pin

Using a 1/8” allen key remove the set screw on the bottom of the 650 ram and slide out the knuckle pin. This pin and set screw will be re-used later in the assembly, set aside in a safe place.

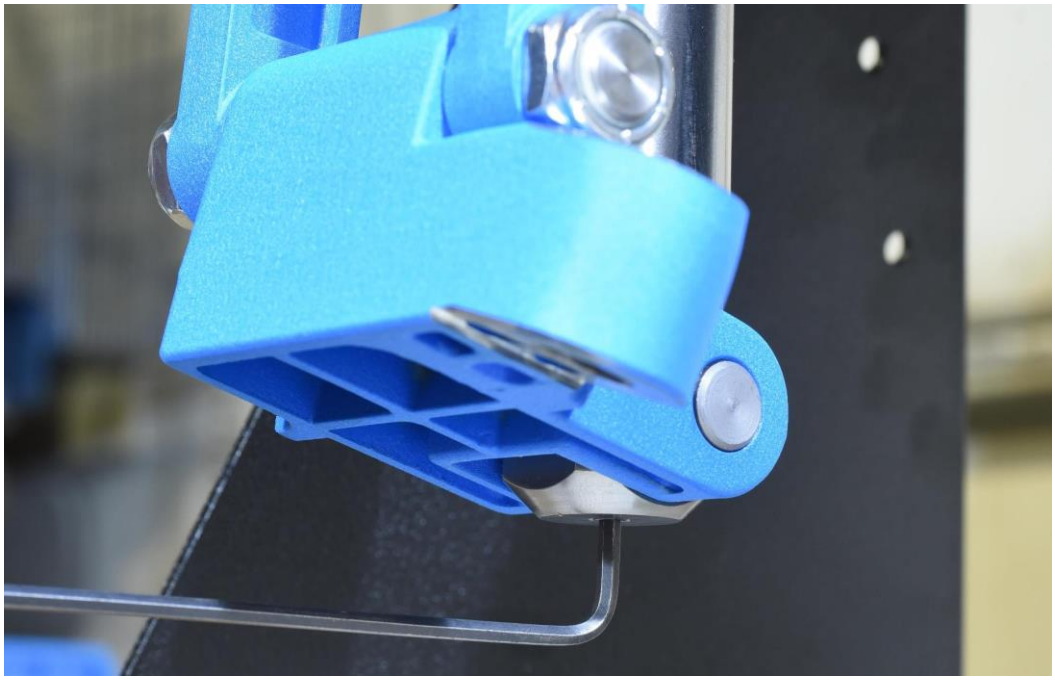


Figure 5: Removing Set Screw from 650 Ram (Do Not Discard Set Screw)

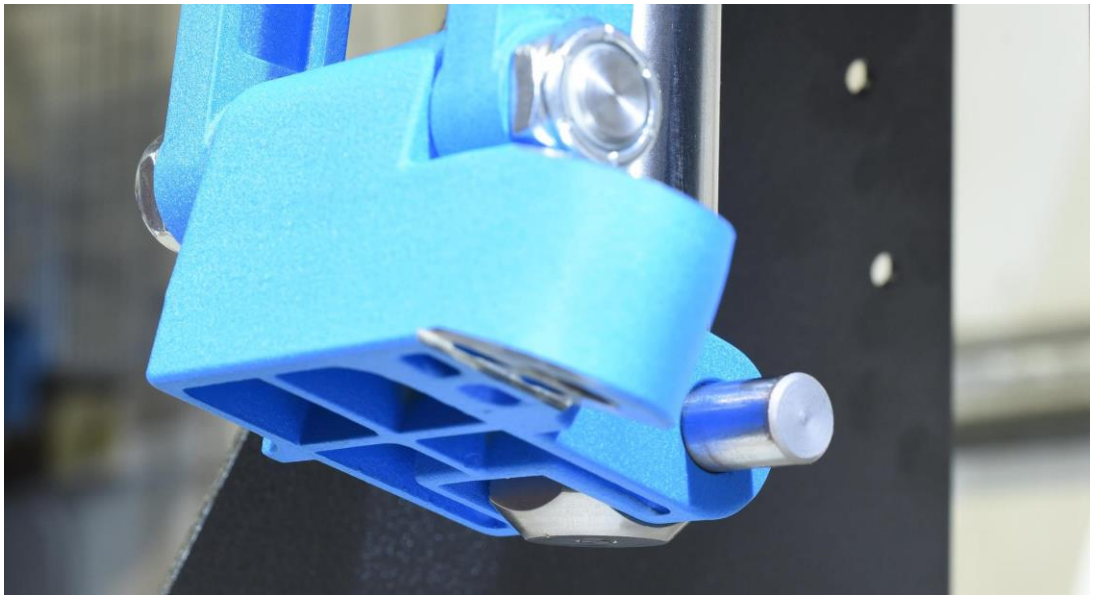


Figure 6: Removing Knuckle Pin (Do not Discard Pin)

4. Removing Link Arms From 650 - Using 2X 7/8” or (22mm) wrenches remove the nuts on the right light link arm. Slide off the right link arm, then pull out the left link arm attached with the pins as an assembly as shown in the figure below.

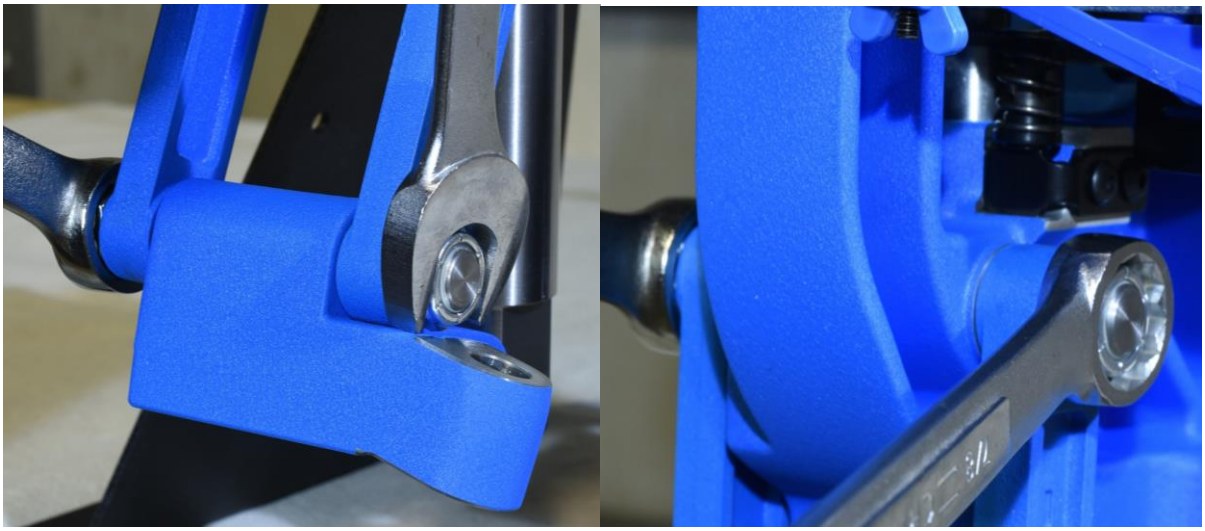


Figure 7: Removing Link Arms (Remove Left Link Arm)

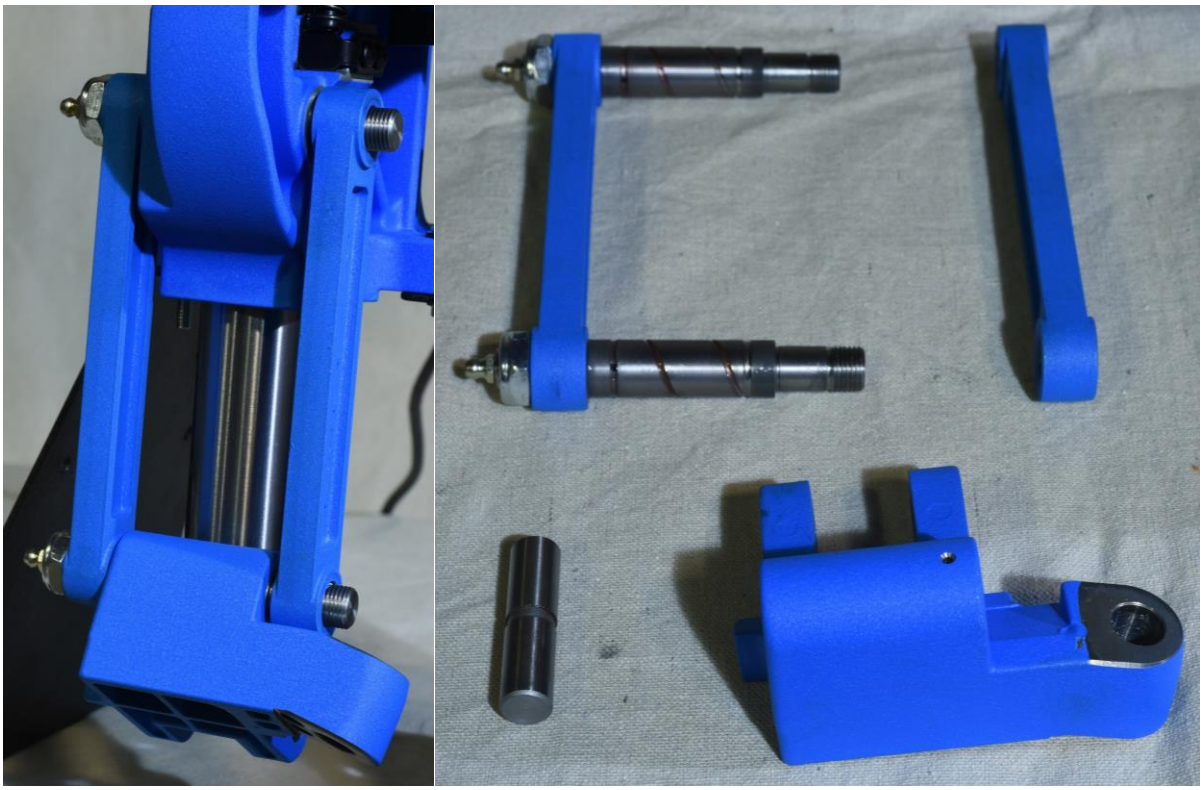


Figure 8: Link Arms, Knuckle and Pin Removed From 650.

5. Removing The Bottom Pin From The Left Side Link

Place the lower pin in a bench vice or vice grips. If possible wrap the pin in a thick cloth or rubber sheet to avoid imperfections due to clamping. Remove the lock nut and slide the left link arm off the pin.

Figure 9: Removing Lower Pin on Left Side Link Arm

Figure 10: Left Link Removed

6. Reinstalling The Link Arms To The 650

Slide the upper pin in the left side link into the 650 frame. Install the right side link on the pin and tighten the lock nuts, keep the lock nuts loose so the link arms can still rotate. Final tightening will occur when the 650 is mounted to the autodrive.

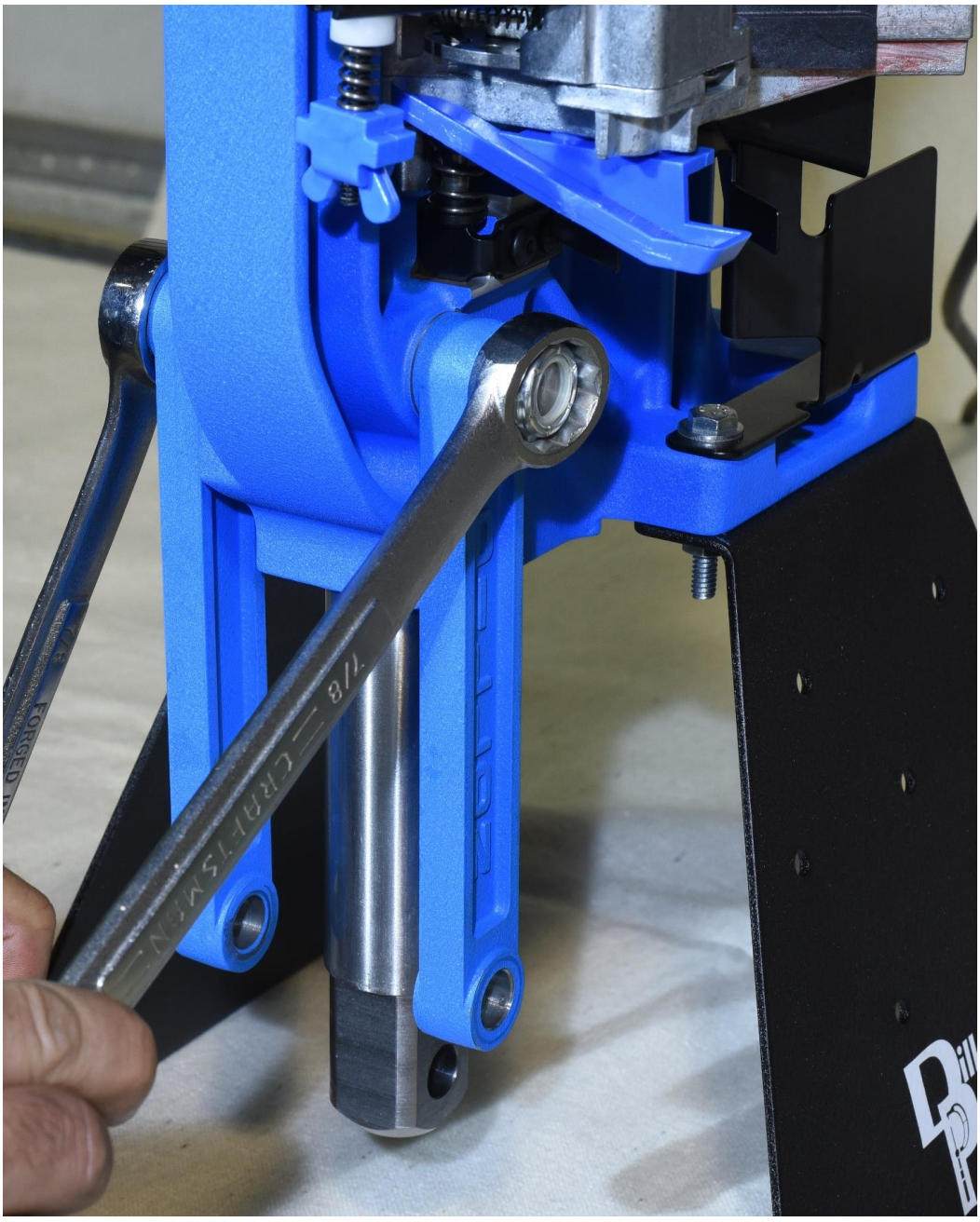


Figure 11: Re-Installing Link Arms to 650 Press (Do Not Fully Tighten at This Stage)

7. Connecting Mark 7® Crank To 650 Ram

Clean the Dillon knuckle pin with alcohol and coat the surface with fresh synthetic multi-purpose grease. Add grease to the contact points on the Mark 7® knuckle and insert the pin through the crank and knuckle and lock in place with the set screw.

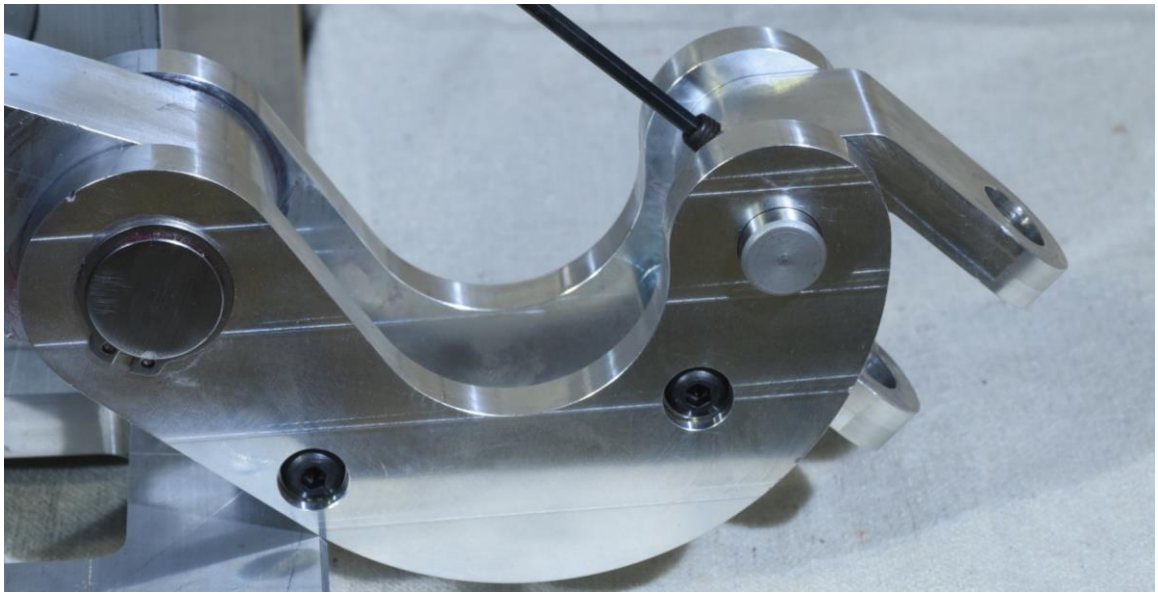


Figure 12: Installing Mark 7® Knuckle to Crank.

There are 2X set screws on the lower crank that lock it to drive shaft. Due to variations in the 650 press these may need to be backed out in order to line up the 650 ram to the Mark 7® knuckle properly.

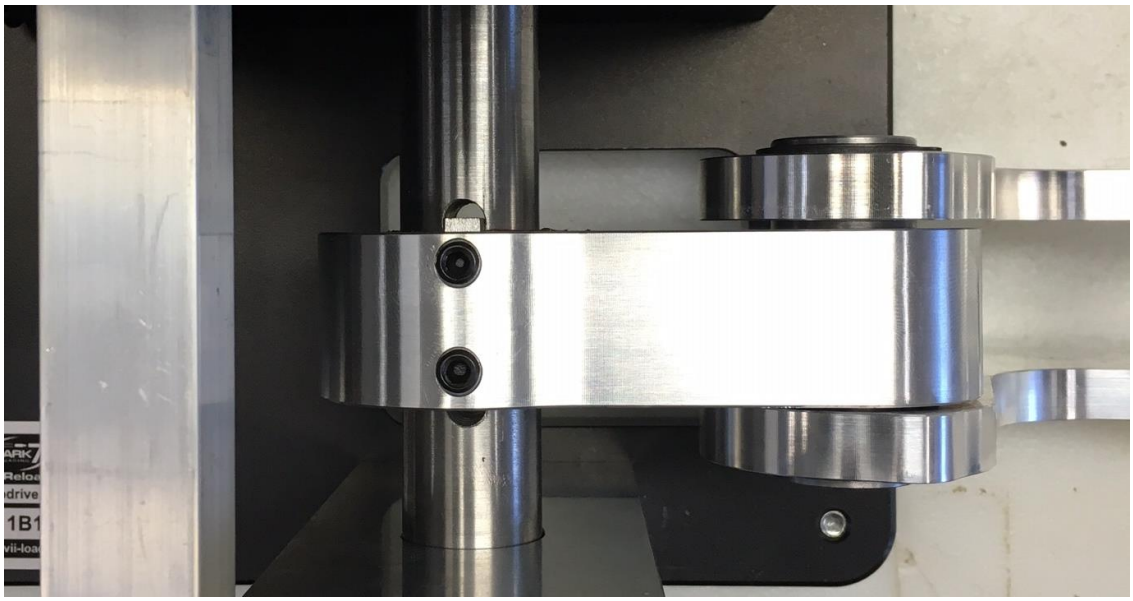


Figure 13: Set Screws on Lower Crank

8. Mounting 650 Onto Mark 7® Autodrive - Place the XL 650 onto the top plate of the mount on the autodrive. Using a 7/16" wrench partially tighten the ¼-20 X 1.5" hex head screws. Rotate the link arms up and away from the front support.

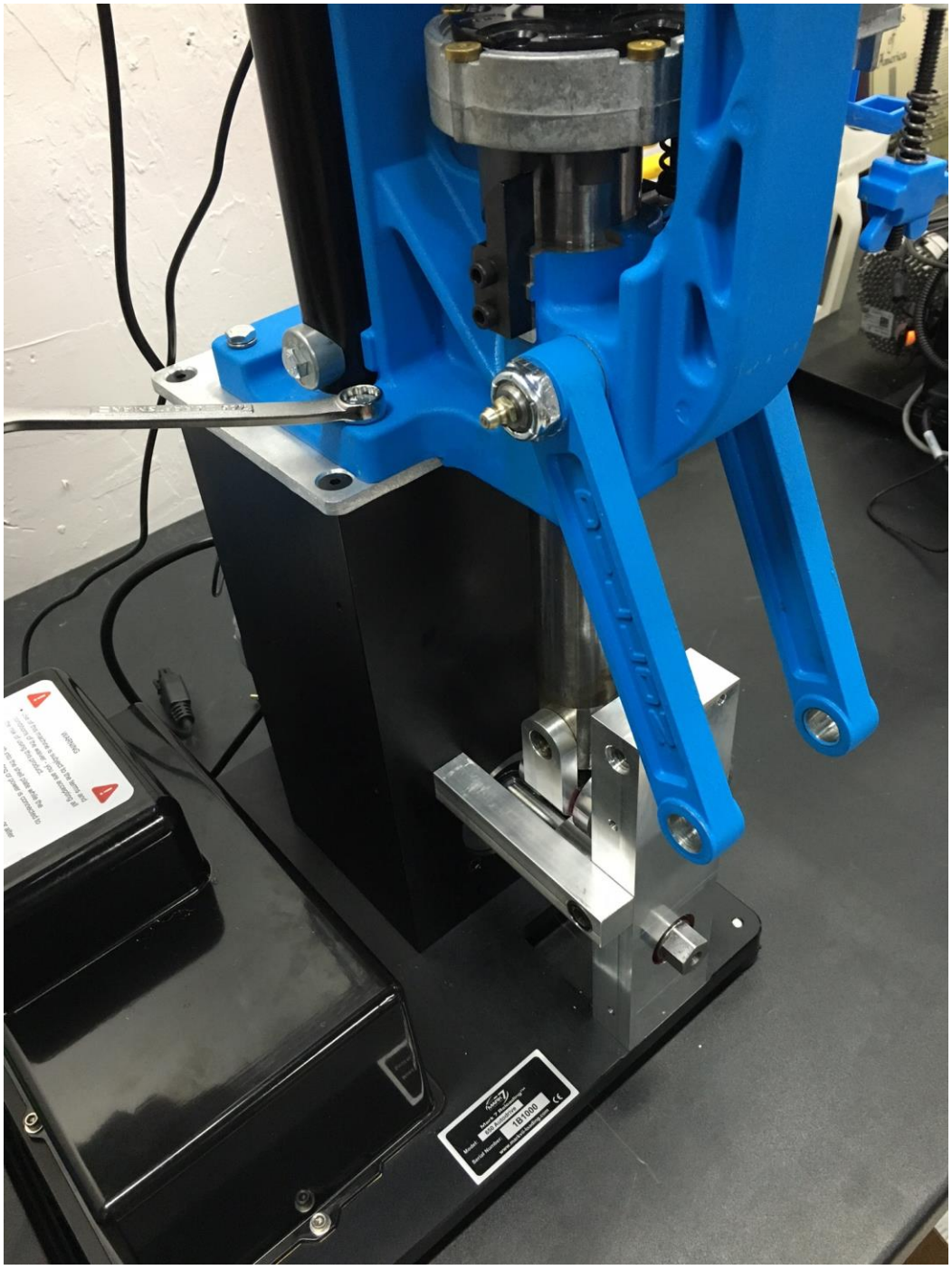


Figure 14: XL 650 Mounted to Mark 7 Mount

Insert the M14 Bolt through the Mark 7® knuckle and through the ram. We recommend moving the shell plate platform to the mid/upper position so the index ring isn't engaged. Make sure both washers on the M14 bolt as shown in the figure below. Partially tighten with a pair of 7/8" (22 mm) wrenches.

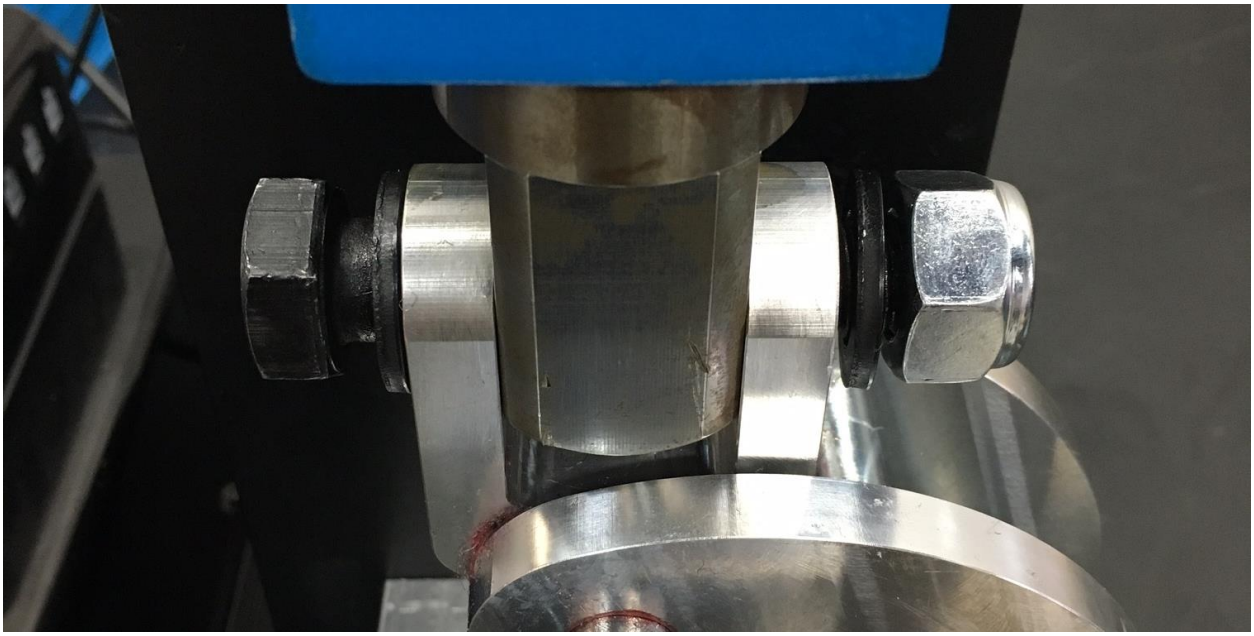


Figure 15: Inserting M14 Bolt through 650 Ram (Shown Partially Tightened)

Rotate the link arms back down and thread the ½ -13" X 1.25" hex head as shown below

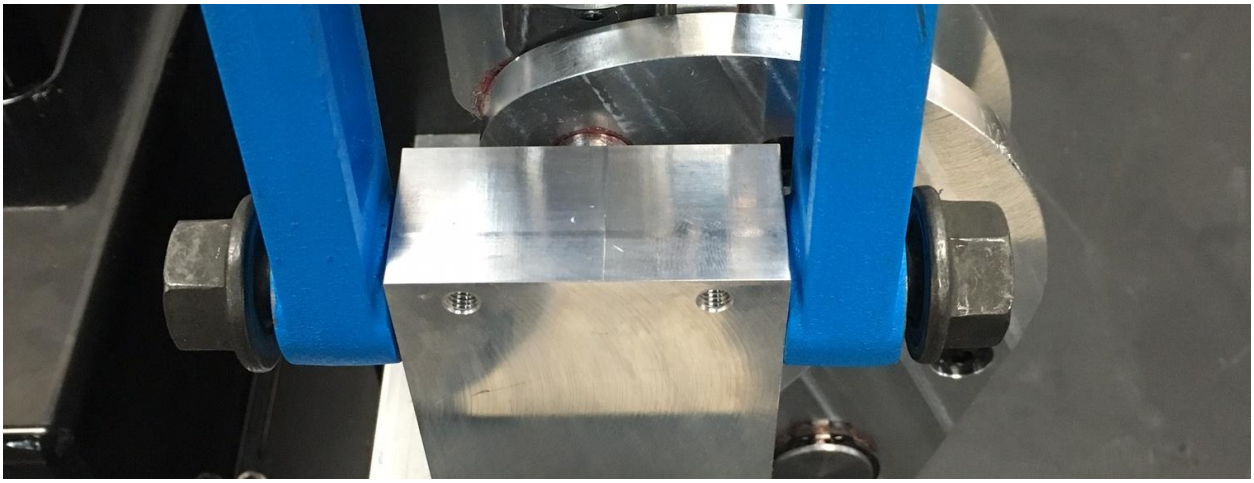


Figure 16: 1/2" Hex Head Screws Partially Tightened

Now that everything is connected, fully tighten the XL 650 to the riser mount, top and bottom link arms, and the M14 Screw through 650 ram. If the 4X set screws on the lower crank were loosened during the install re-tighten with medium Loctite if possible.

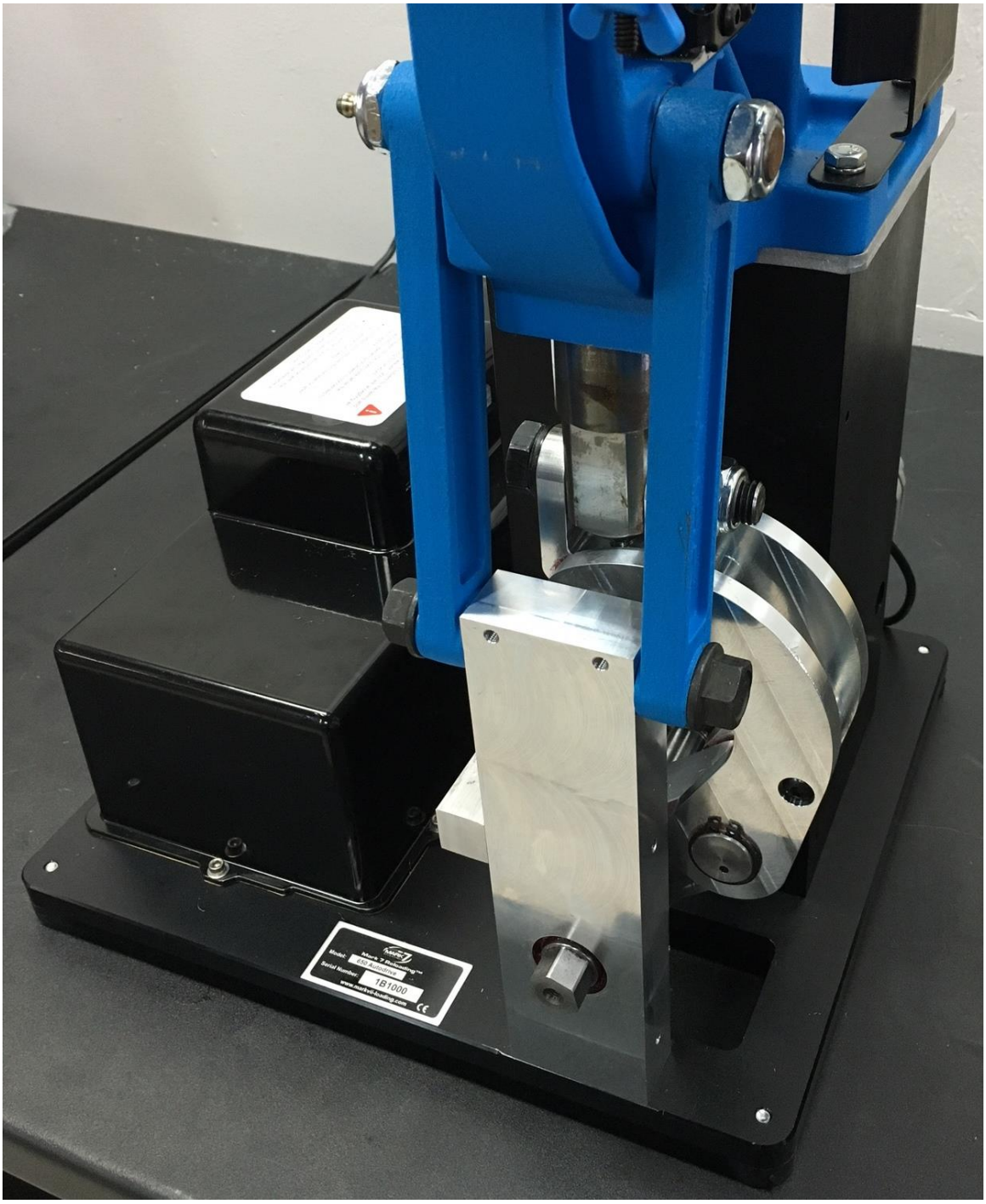


Figure 17: XL 650 fully mounted

9. Installing Crank Shield

Remove the backing tape on the crank shield and place the shield around the crank on the right side of the machine. Gently flex the plastic so you can adhere the 3M tape to the backside of the front support and front side of the riser mount.

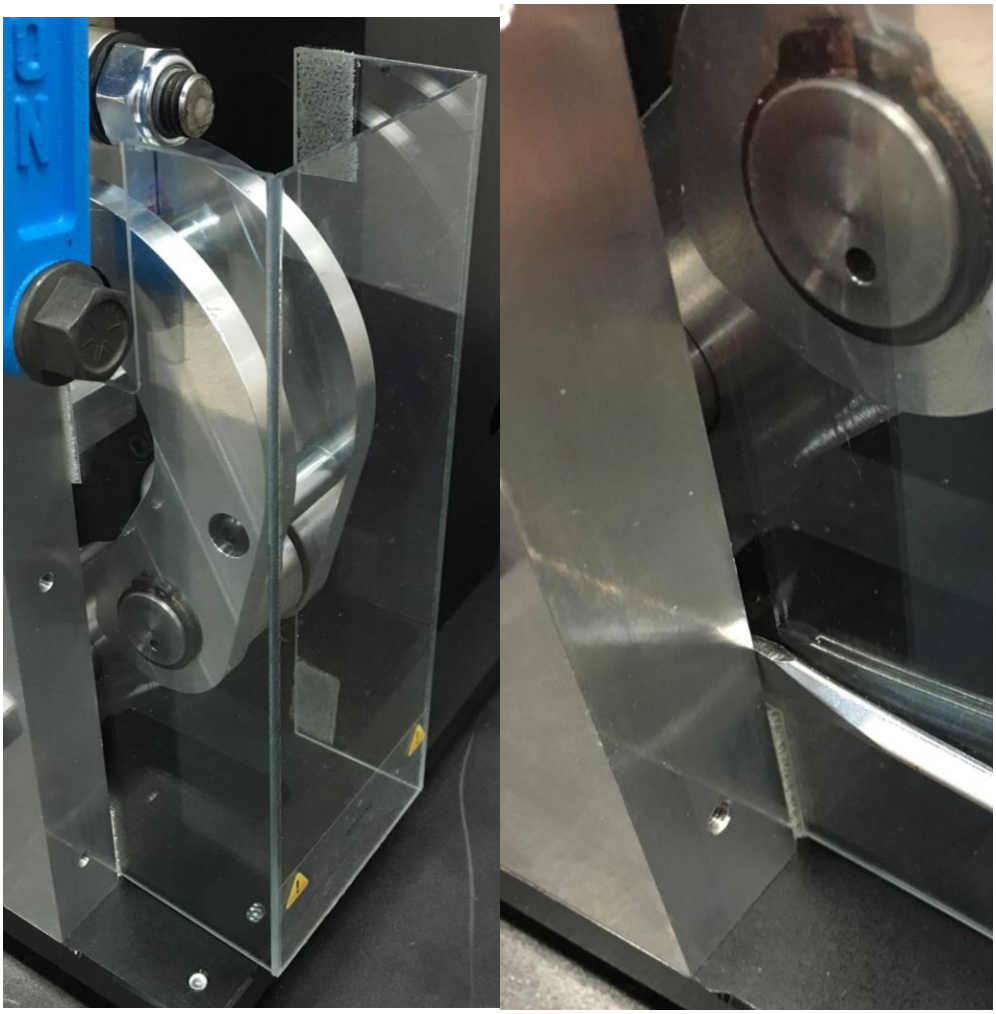


Figure 18: Shield Installed (Left). Removing Shield (Right)

Firmly press on the inside of shield to allow the adhesive to achieve a proper bond. **To remove the shield gently pry at each corner with a flat head screw driver to disengage the 3M tape as shown in the right image below.**

10. Tablet & holder installation

The tablet holder can be mounted directly to the 650 case feeder pole or remotely next to the machine. First attach tablet holder arm to the tablet holder. The tablet holder will make a positive clicking sound when it is seated correctly. Clamp the tablet holder to the desired location.

Figure 19: Recommended Tablet Mounting Location (Standard 9 Inch Tablet Shown Above)

WARNING – The operator of the press should always stand in front of the machine, facing the tablet with hands near the tablet to press the STOP button in the event the press needs to stop. You should visually see the decapping die spent primers and watch for bullets toppling or powder spilling. The best vantage point for this is standing to the front left or right side of the machine.

Figure 20: Tablet Holder orientation for 9 inch tablet (left) 10 inch (Right)

Figure 21: Side view of Tablet holder 9 inch (left) 10 inch (Right)

Once tablet holder is positioned, carefully pull tablet holder laterally to expand enough to accommodate tablet as shown above. Be mindful that the arms do not cover the power or the micro-USB inputs on the tablet.

Figure 22: Tablet Connections

Once the tablet is mounted, plug the power cable coming from the console into the tablet's power jack located directly below the Micro-USB. Insert Micro-USB into the input located directly above the power jack. The Micro-USB cable is a 2-part assembly**, the short adapter with the tablet label plugs into the tablet. The long portion of the cable plugs into the console; see section 11 or port location. The USB CONNECTION WILL ONLY WORK PLUGGED IN THIS ORIENTATION.** The Power button is located on the upper right side of the tablet.

WARNING – Ensure that the cables are coming from the tablet to the right of the unit. They should be zip tied or otherwise gathered so that they do not interfere with the operator's vision of the unit and are completely out of the way of the operation of the unit. Do not zip tie the tablet cables to Dillon case feeder or Mr. Bulletfeeder power cords.

11. Console cable locations and setup

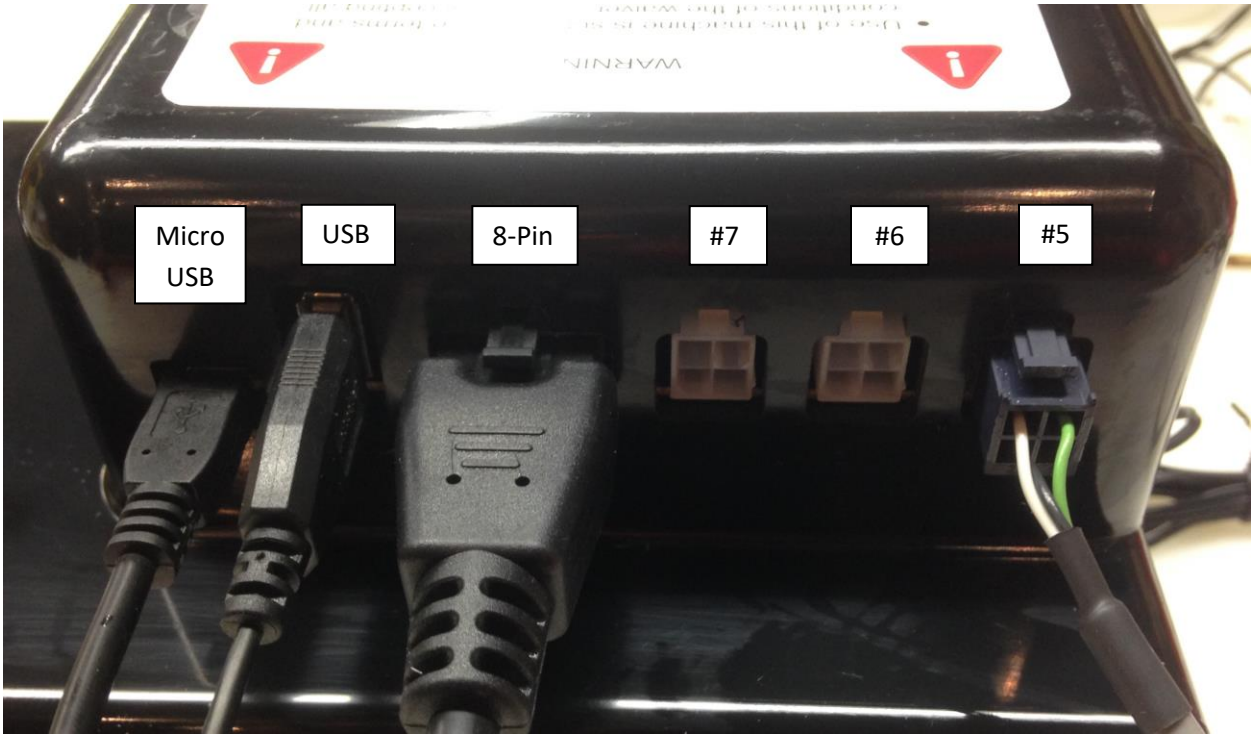


Figure 23: Side of Console Inputs

Before powering on the Mark 7 Units please make the following connections:

Micro-USB: Tablet to Console USB data communication cable

USB: Motor to Console USB data communication cable

8-Pin: Motor to console signal cable

Port #7: POWDERSense (optional)

Port #6: Wired Remote Stop (optional)

Port #5: Optical Decapping Sensor™ (included)

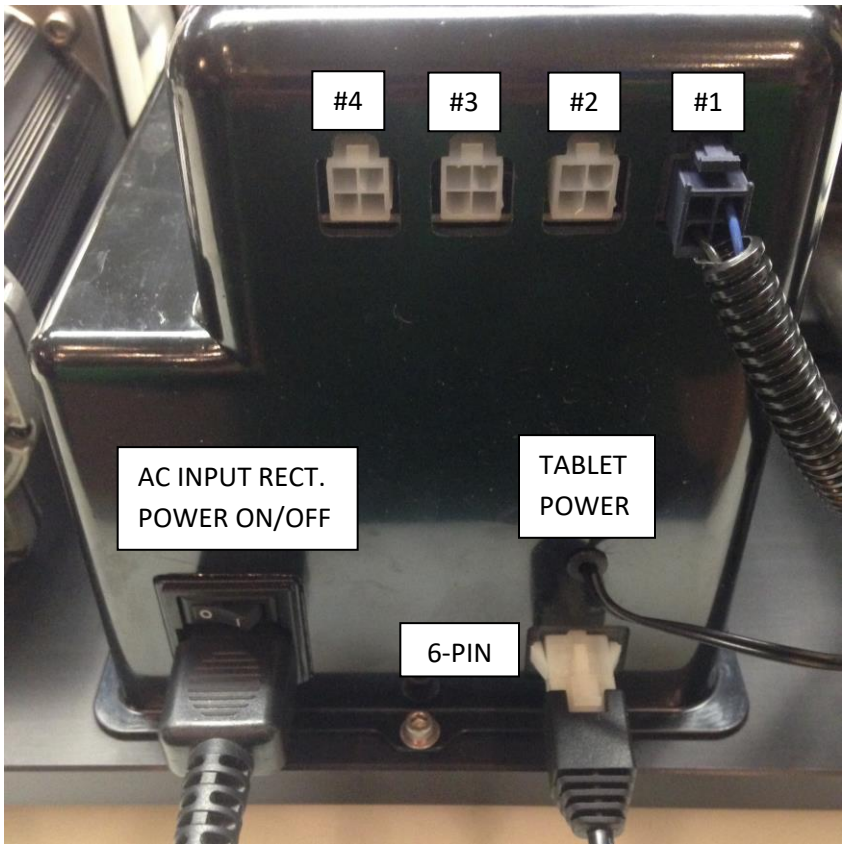


Figure 24: Rear of Console Inputs

Port #4: Available

Port #3: BULLETSense (Optional)

Port #2: Available

Port #1: PRIMERSense (Optional)

AC INPUT & Power ON/OFF Receptacle: Units are configured in either 110V or 220V.

6-Pin: Motor to Console DC Power Cord

Tablet Power Cord: Connect to tablet

WARNING – Never power on the console switch without the 6-pin Molex connector plugged in and never install this connector with the power already on since the DC voltage would damage the motor's input contacts.

The following connections below MUST be connected and secure before the unit is powered on. Refer to the previous section for optional sensor port locations

Figure 25: Required System Connections

12. Manually Driving The Press

Before you power on the Autodrive it is important to check that everything has been installed properly and the press in is full working order. Use a 11/16” wrench or socket to manually drive the crank up and down to fully drive the 650. Make sure there is no interference or change in resistance during the stroke. If a jam occurs while running the machine we recommend manipulating the press manually once the jam has been cleared. Refer to the reloading manual for more information.

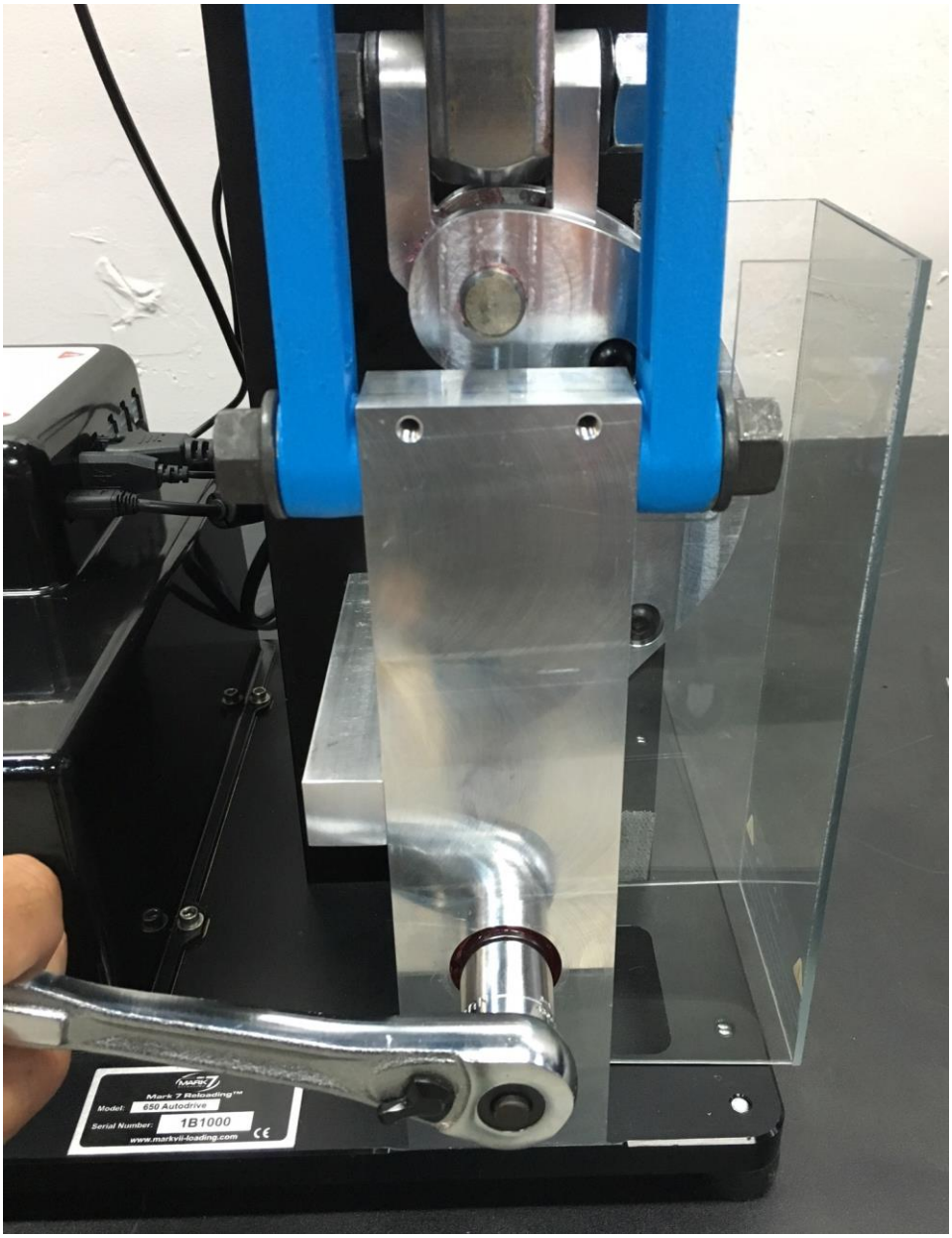


Figure 26: Manually Driving the 650

13. EMI Filter For Bullet Feeders

To reduce electrical noise from the bulletfeeder motors install the provided filter on top of the micro-switch in the Mr. bulletfeeder drop tube and/or GSI feeder. Note: A small modification may be required to install the filter on the GSI feeders.

Figure 27: Filter Installed on Mr. Bulletfeeder (Double Alpha)

14. EMI Filter for Dillon Case feeder

We have found some of the brushed AC motors and microswitches in the Dillon case feeder produce more noise than others. If your system is experiencing electrical interference we recommend installing the RC filter and microswitch Assy. The RC filter provided is pre-crimped with spade terminals to minimize the installation. It plugs directly into the Dillon case feeder on/off switch. No wiring cutting or special tools required.

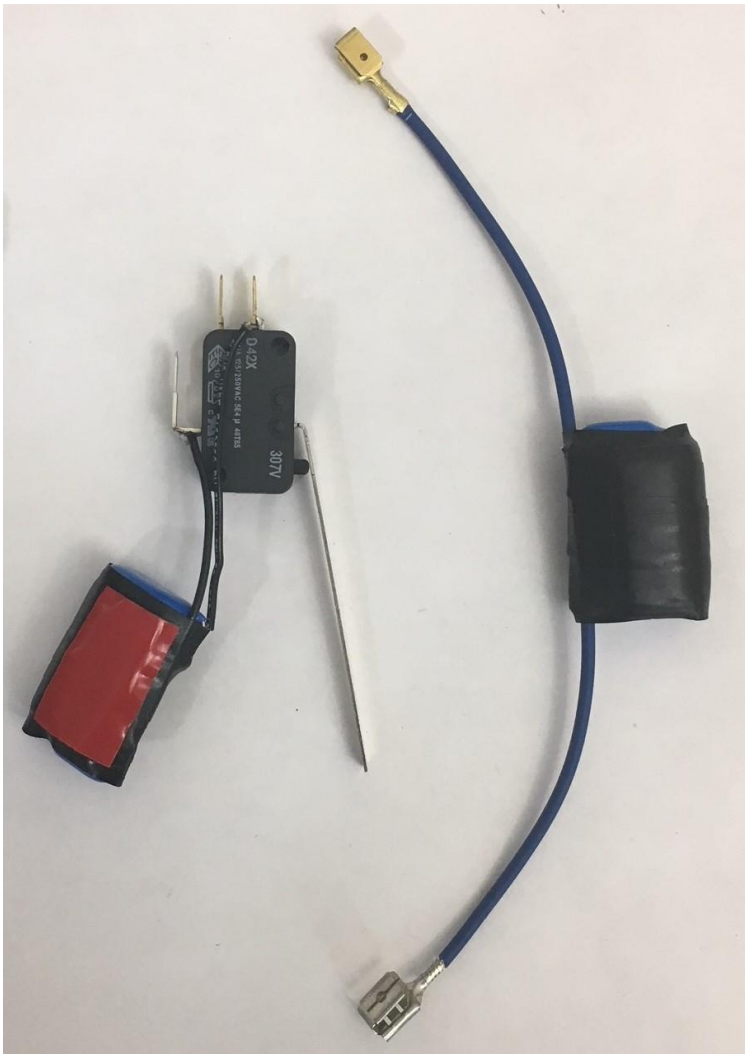


Figure 28: Case Feeder RC Filter

WARNING – Use of the RC filter is at your risk and only for those experienced with electrical systems and is only for the systems that are experiencing interference*.

Installation Procedure – for later model, U.S. case feeders.

1. Unplug the power cord to the Dillon case feeder.

2. Using a ¼ socket or nut driver remove the front cover plate on the case feeder. Remove and replace the microswitch with the filtered microswitch included in the kit.

3. Plug the RC filter into the microswitch as shown below and into the center position of the on/off switch. Plug the Power lines into the corresponding male terminal leads on the RC filter terminals as shown below.

4. Reinstall cover plate and test for proper operation.

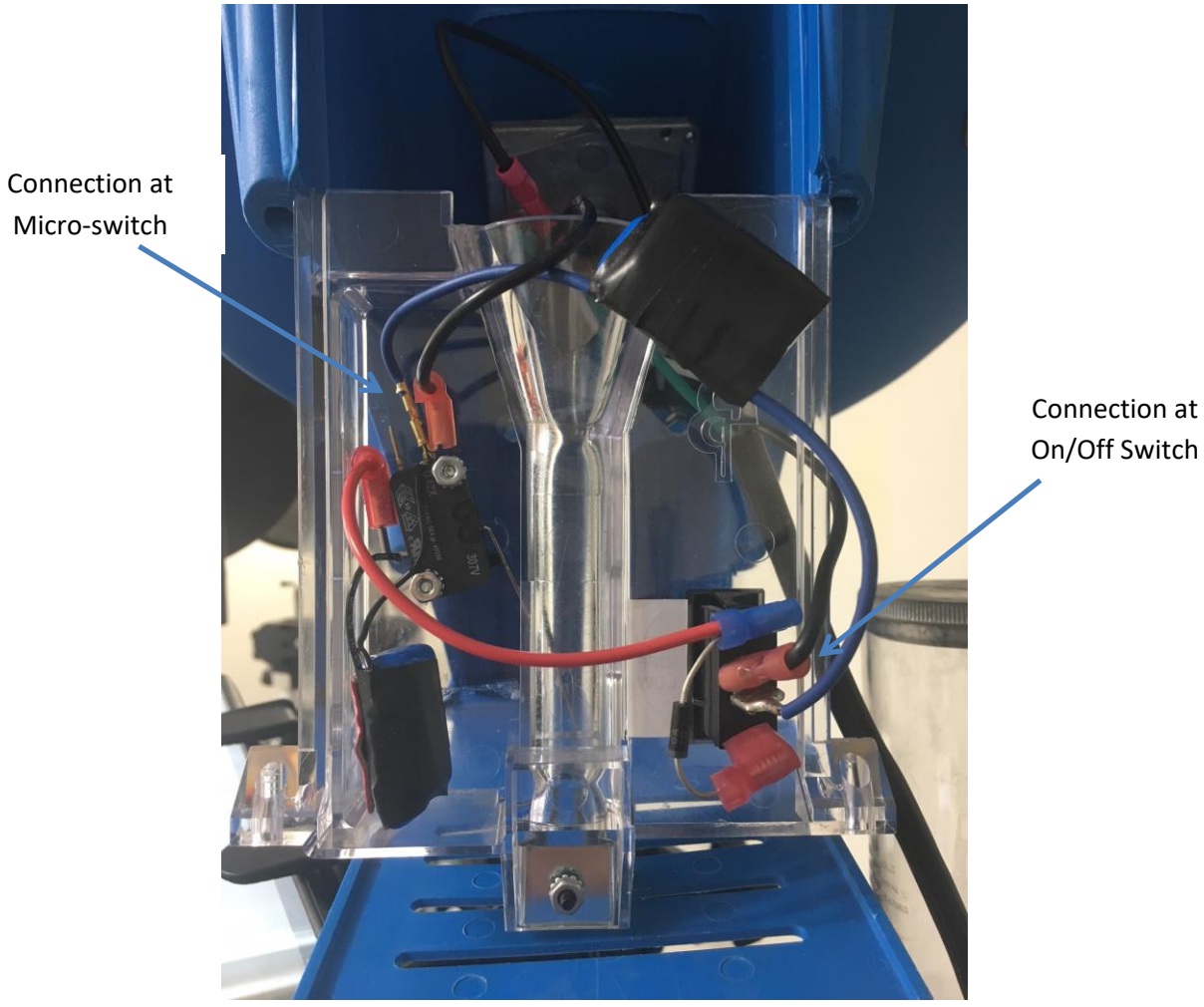


Figure 29: Case Feeder RC Filter

Installing Optical Decapping Sensor™

WARNING – Use of the Mark 7® Decapping Sensor™ is at your risk and only for expert reloaders. This is a product that is designed to improve the safety of the reloading operation. NEVER RELY ON THE DECAPPING SENSOR. You must monitor its use – ALWAYS. Always be close to your machine and available to stop the machine if it needs to be stopped.

The Mark 7® Decapping Sensor™ Package Includes:

- Mark 7® Decapping Sensor™
- 8-32 X 3/8" socket cap screw and washer (2X)
- 3/8” ID PVC Clear tubing
- Cable Ties

Decapping Sensor™ Installation Instructions

Remove the spent primer bin and bracket on the 650 as shown below

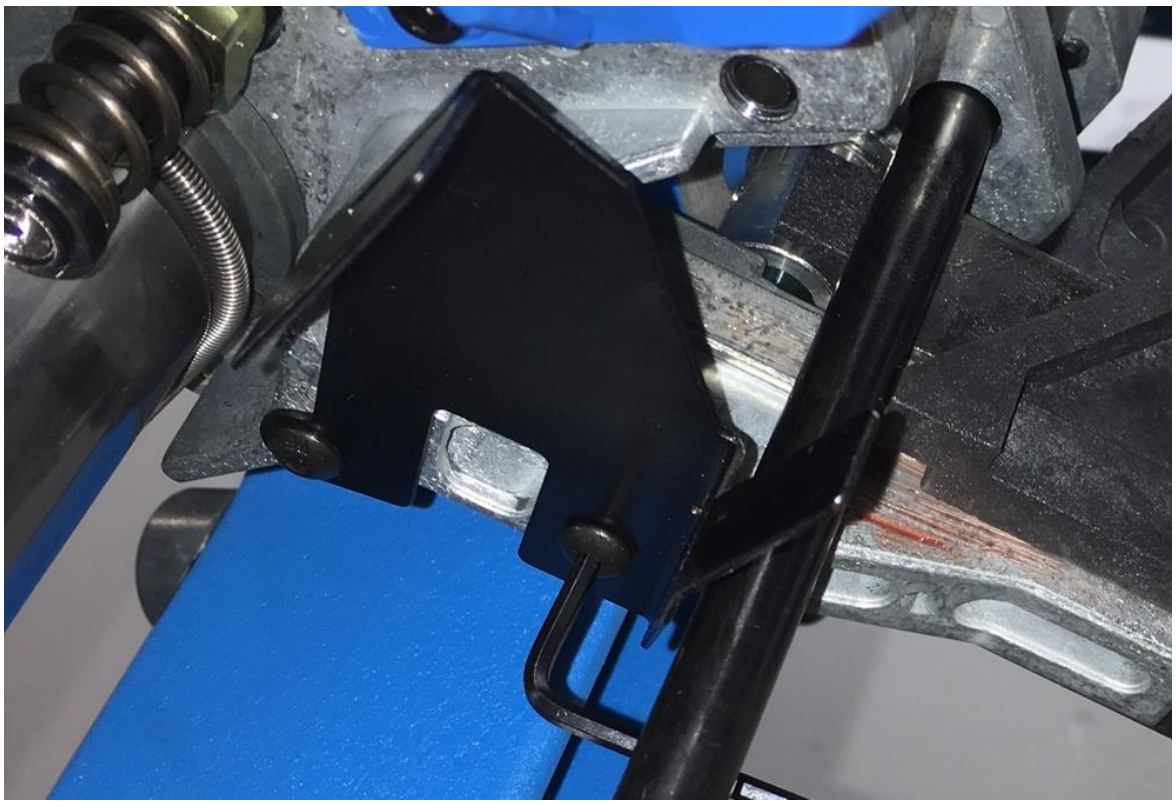


Figure 30: Removing 650 Primer Bracket

Install the Mark 7® Decapping Sensor™ with the provided hardware to the bottom of the 650 platform assembly. It is important that the cable orientation exits towards the front of the press. Attach the hose and route into a bucket or other spent primer collection container. Plug the cable connector into the assigned console port (Refer to section 11).

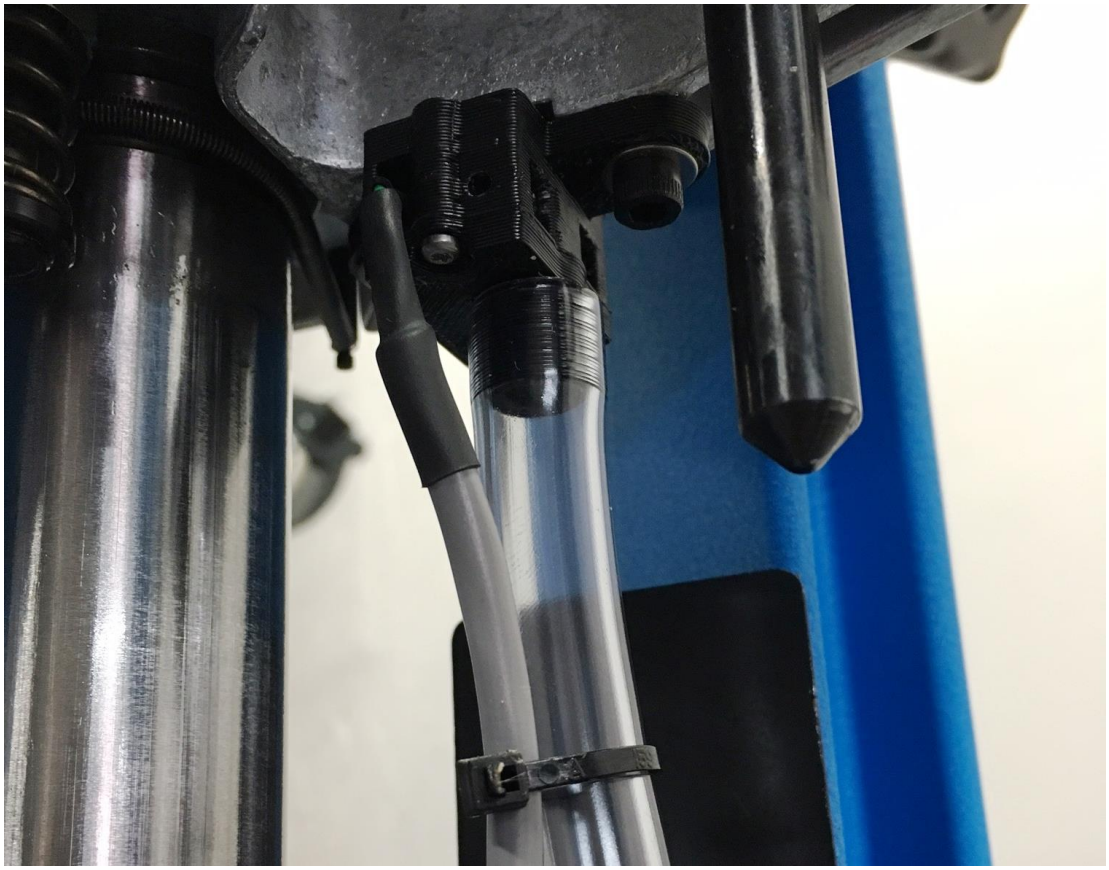
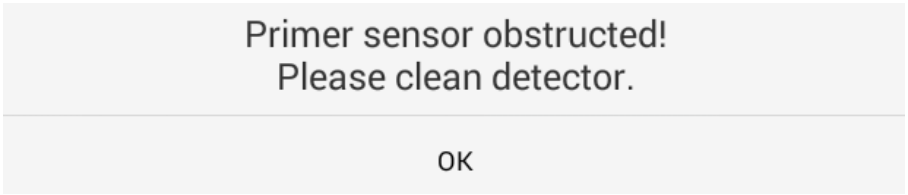


Figure 31: Decapping Sensor Installed

During operation the optical sensor may become dirty and require cleaning. The following notification box MAY appear when cleaning is required.



In either case the recommended cleaning interval is every 500-700 rounds that are decapped. Using a duster can or compressed air, spray into spent primer hole in the 650 platform and into the front hole on the decap sensor shown below. It may be necessary to remove the sensor.

proper cleaning.

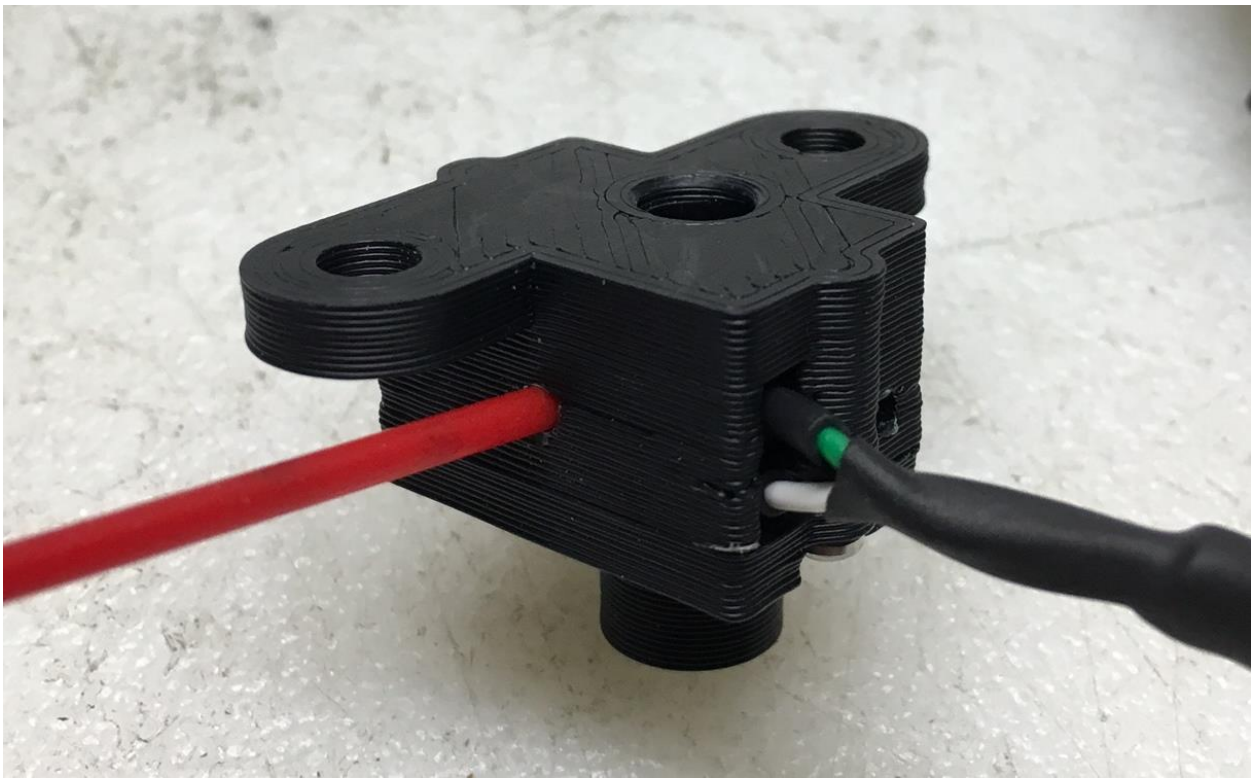


Figure 32: Blowing Out Decapping Sensor with Compressed Air.

WARNING – Cleaning intervals of the Mark 7® Decapping Sensor™ will vary dramatically based upon many factors. WE SUGGEST CLEANING THE MARK 7® DECAPPING SENSOR™ AS OFTEN AS PRACTICAL – IT IS UP-TO YOU TO ENSURE THE SENSOR IS CLEAN.

If you don't have mounting holes for the decapping sensor on the bottom of you 650 platform you will need to upgrade to the new style design Dillon Part # 22060. You will also need the new style primer punch for both small and large primer Dillon Part # 21380 & # 21381.

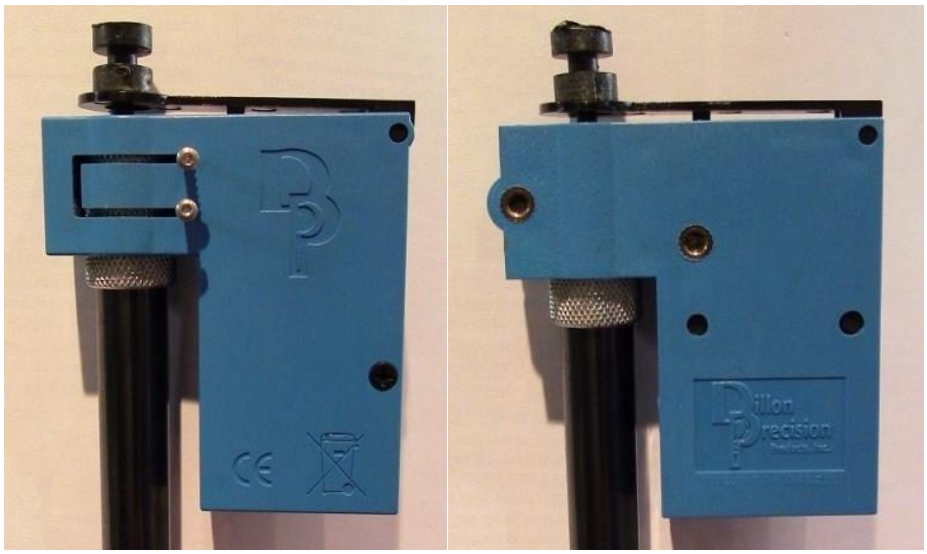


Figure 33: New Style Left, Old Style Right

The Low primers Senor mount works with both the new and old style Dillon low primer alarms. Mounting on the new style primer alarm requires a Torx screws that thread into existing holes in side. Mounting for the old style requires replacing the bottom 8-32” screws with the screws supplied with the mount as shown in the figures below.

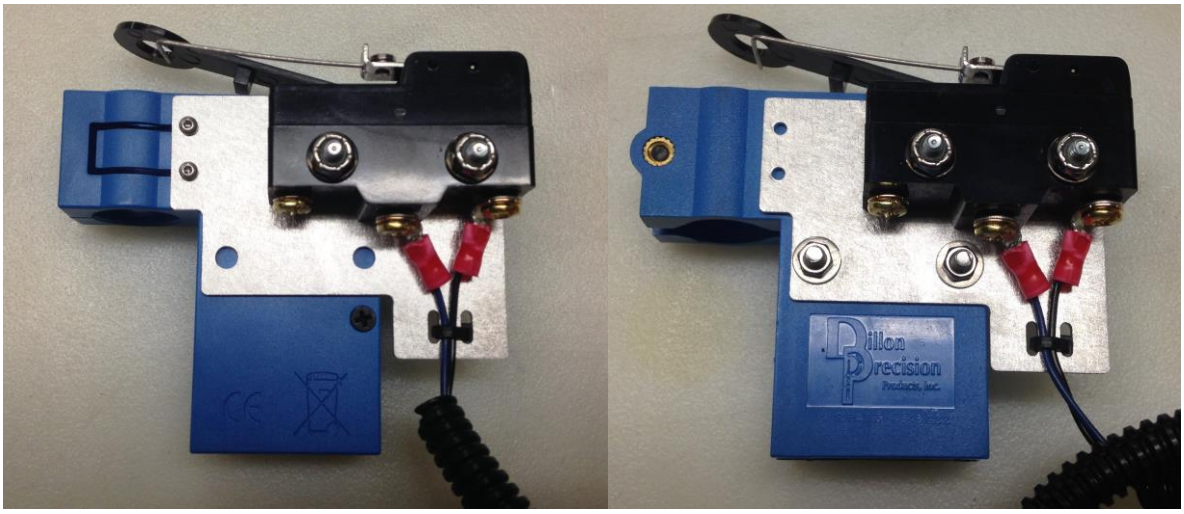


Figure 34: New Style mounted Left, Old style Mounted Right

A 45 Caliber case or equivalent weight can be put at the top of the primer follower stick if needed to ensure accurate depression of the hardware primer sensor.

Box Contents and General Setup:

1. First review the box contents to make sure all parts are included:
    a. Setup Insert
    b. 650 BulletSense® Bracket Assembly
    c. Mirror Bracket (Mirror Holder attached to Mirror Arm with 2X flat head screws)
    d. 2X ¼-20 x 3” socket head cap screws for mounting to case feeder pole
    e. Offloading bracket (modified for pistol calibers)

Figure 35: Package Contents

2. Check the software and firmware version installed on your machine and make sure it’s at least the version listed below (or newer) before installing 650 BulletSense®. The latest updates are available on the software updates page.

650 X: SW 00.01.13 FW 18
650 PRO: SW: 00.01.13 FW 26

3. The mirror holder is shipped with a protective film over the surface, before starting setup, peel off the film. If required the mirror surface should be cleaned with water or isopropyl alcohol, do not use any other types of solvents.

Installing BulletSense® Main Assembly:

1. Begin by clearing the shell plate and powering off the machine and tablet. Remove the tablet, tablet holder, and offloading bin and set aside.

2. If Locate and remove the offloading bracket bolts (X2) with a 7-16” socket and set aside (see Figure 2).

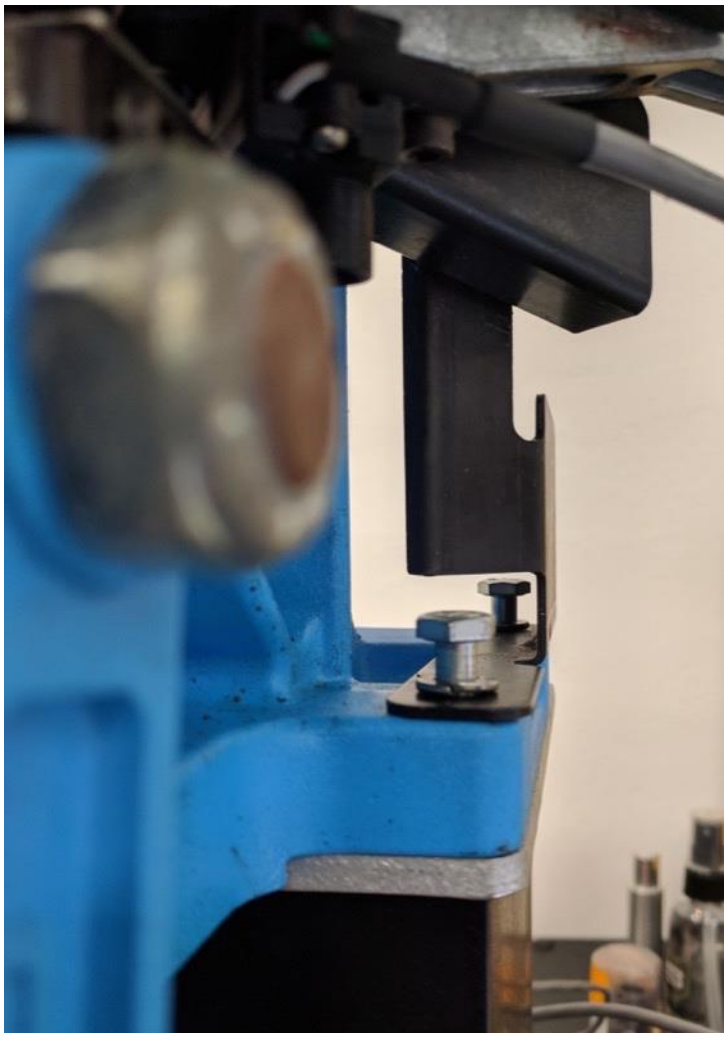


Figure 36: Removing offload bracket

3. The case feeder pole bolts need to be removed to install the BulletSense® mounting bracket. It is recommended to remove the case feeder or have an assistant hold the pole in place so the case feeder does tip over. Carefully remove the case feeder pole bolts with a 3/16” Allen wrench and with a 7/16” socket affixed on the opposite side of the press (see Figures 3 and 4).

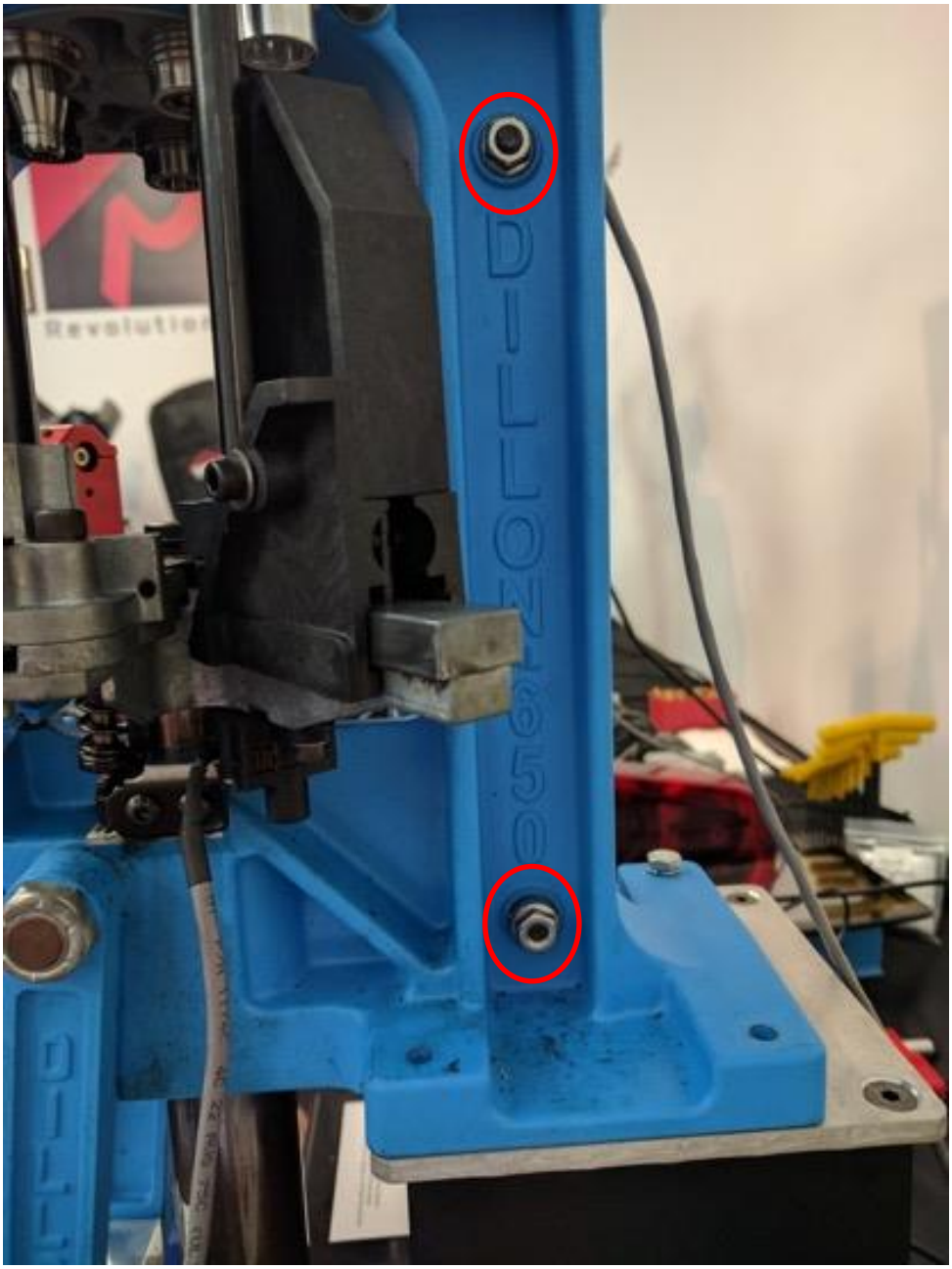


Figure 37: Case Feeder Mounting Bolt Locations

4. Install the 650 BulletSense® Bracket Assembly as shown in the figure below (Figure 4). Use the longer ¼-20” bolts provided.

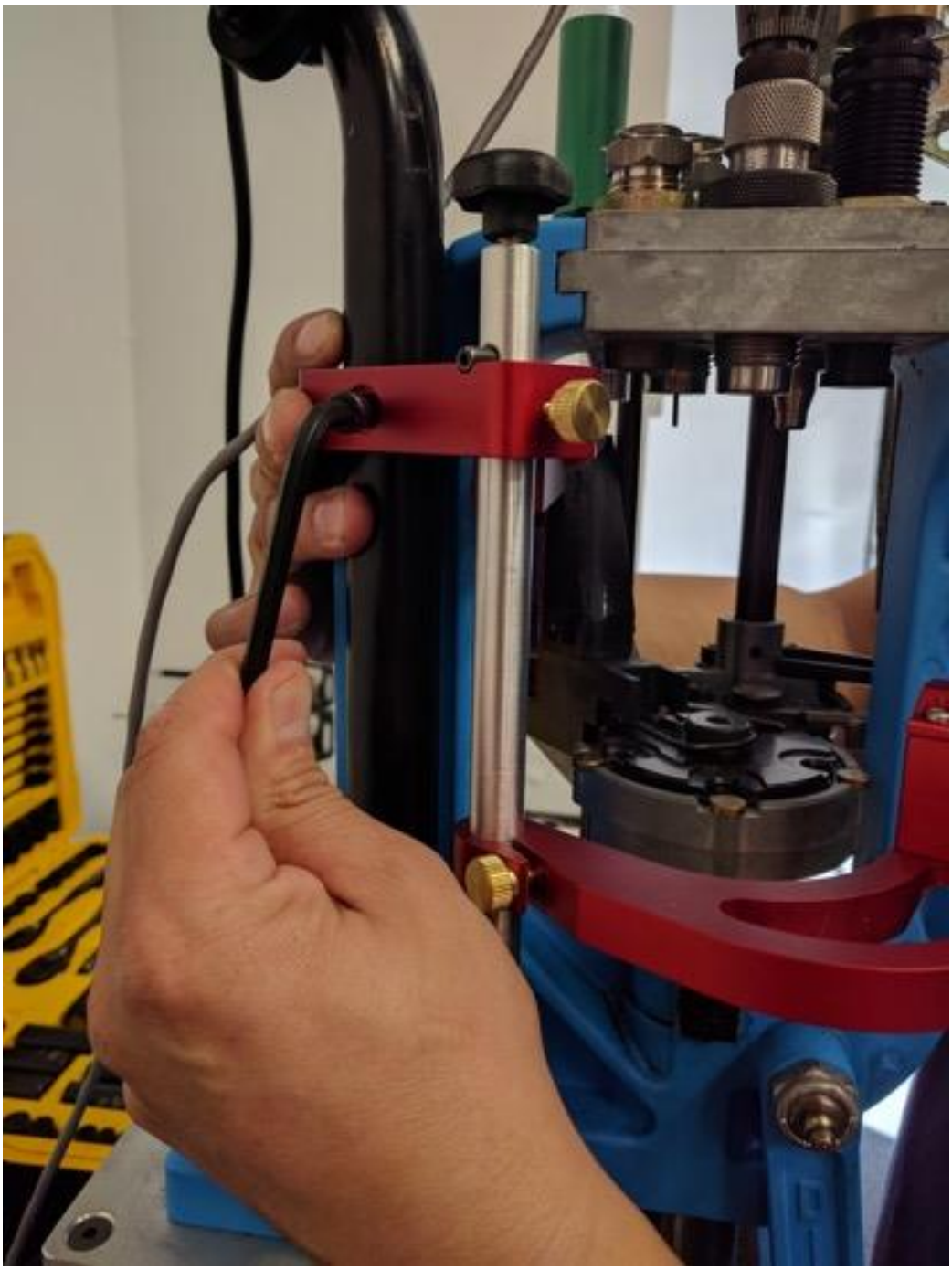


Figure 38: Installing BulletSense® on XL 650.

5. Attach the Mirror Bracket to the top bracket mount with the 2X flat head 8-32 X 1.25” cap screws. The mirror then can be adjusted using a 3/8” open ended wrench.

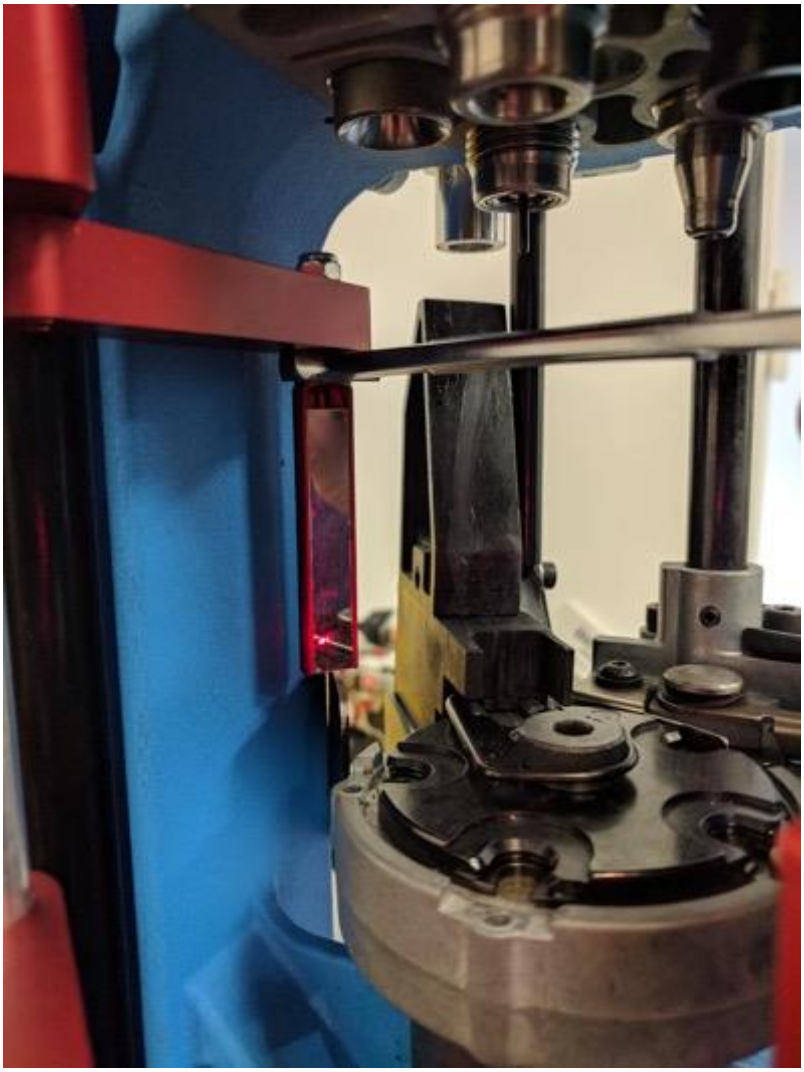


Figure 39: Installing Mirror Bracket

6. Attach the offloading bracket provided with the screws that came with the press if you are loading pistol calibers. **Note for rifle calibers:** The standard bracket can still be used for rifle (it just covers the bottom of the mirror). This isn't an issue though because the laser head is mounted higher due to the taller cases and longer projectiles.

Adjusting BulletSense® Laser for Station 4 and Station 5:

1. BulletSense® can be configured in either station #4 or #5 (depending on whether you are using a PowderSense®).

   Station 4: BulletFeeder dropper in Station 3 with standard crimp and seat dies.
   Station 5: BulletFeeder dropper in Station 4. (using PowderSense® Powder check)

2. Once you decide which station, align the 650 BulletSense® assembly with the mirror holder by loosening the sensor head mount (middle arm) brass thumb screw and rotating the sensor head to meet the mirror (see Figure 6).

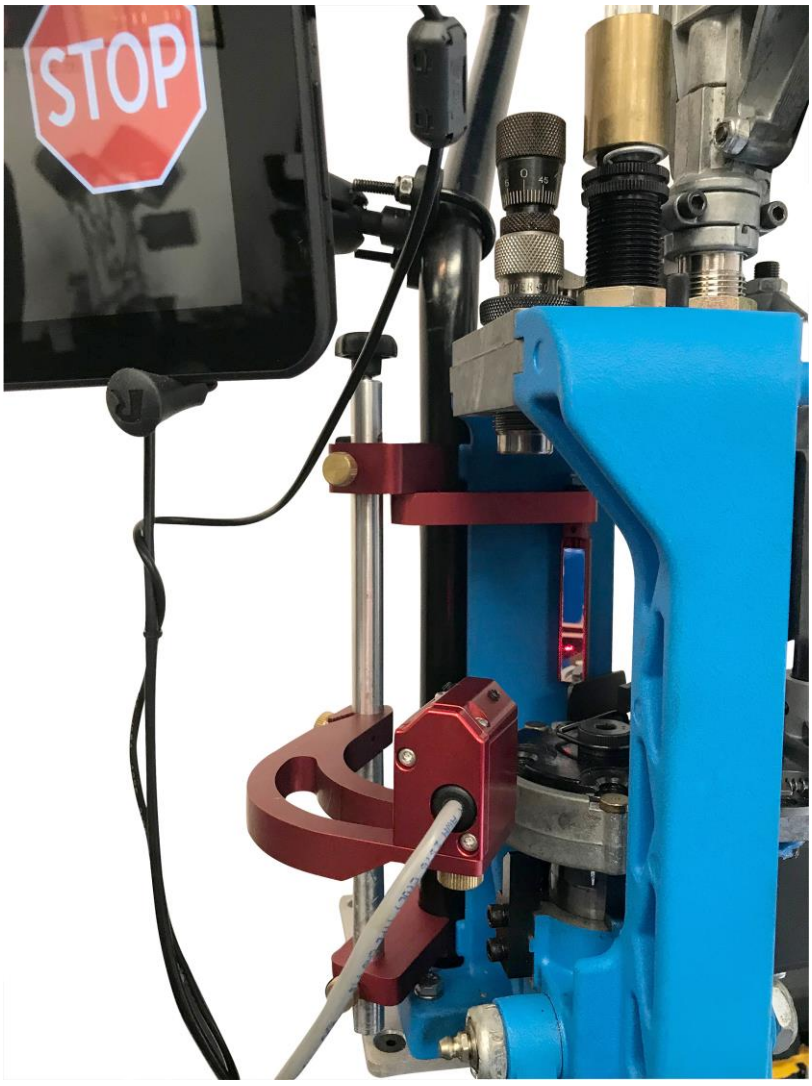


Figure 40: Lining Up Laser with Mirror (Crude Adjustment)

3. Plug in the Sensor into Port #3 and power on the console which will automatically turn on the laser. When you first power on the sensor look at the mirror to see where the

laser beam is directed. Use a thick white card/flat object to help find the exact position if it's difficult to detect the position.

****Please do not look directly into laser beam or directly at reflection in mirror****

WARNING – Class 3R laser: Avoid eye contact at all times; do not look directly into the laser when adjusting the laser alignment.

4. Adjust Laser beam onto the mirror with the 2X 6-32" set screws on the top of the assembly with a Torx screwdriver size T6 x 40mm. Once the Laser diode is hitting the mirror surface rotate the mirror using a 3/8" wrench so the laser beam is reflected back to the sensor main body. Once the reflected laser beam appears on the sensor main body, continue adjusting the set screws a little at a time to direct the laser beam into the sensor hole as shown in Figure 7.

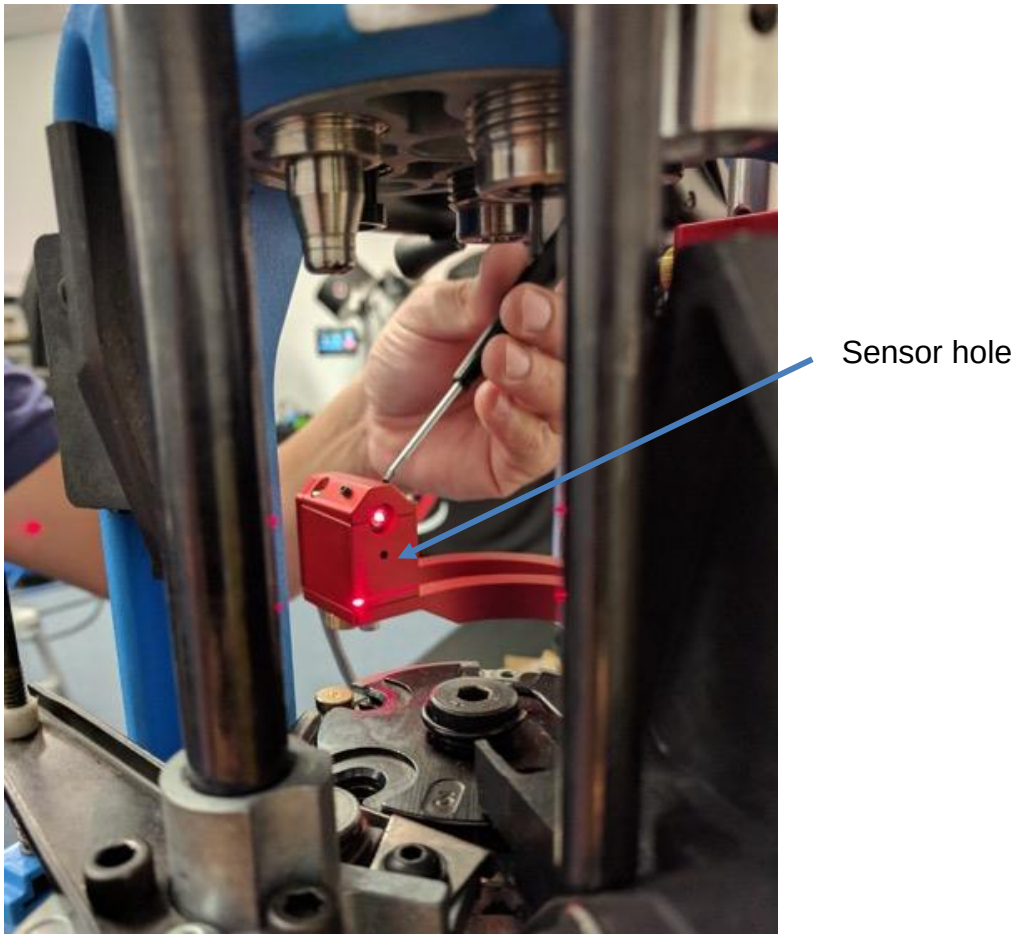


Figure 41: Adjusting Laser

5. Next the sensor vertical height must set for the given caliber and projectile being used. This must be performed when the platform assembly is in the home position. Before

making the vertical adjustment perform a system calibration so the platform stops in the home position.

6. To set the vertical adjustment, place a case with the neck expanded (pistol only) in Station #4 or #5 and place a bullet in the proper orientation into the case at the level where it would be when dropped from the Mr. Bulletfeeder® drop tube.

7. Loosen the brass thumb screw and gently position the sensor head mount (on middle curved arm) so the laser beam goes OVER the tip of the bullet and hits the mirror, the reflected beam should return and hit the tip of the bullet so the beam path is broken as shown below (Figures 8 and 9). Once the height has been set, remove the bullet and make sure the laser is still aimed at the sensor hole.

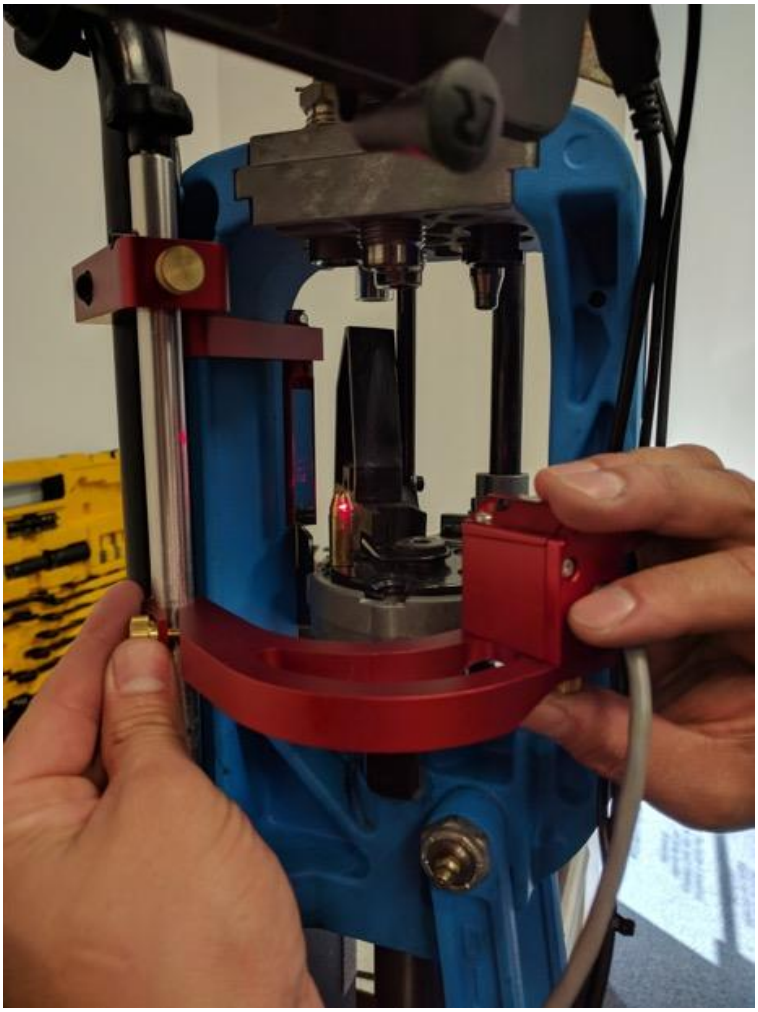


Figure 42: Setting Vertical height of laser

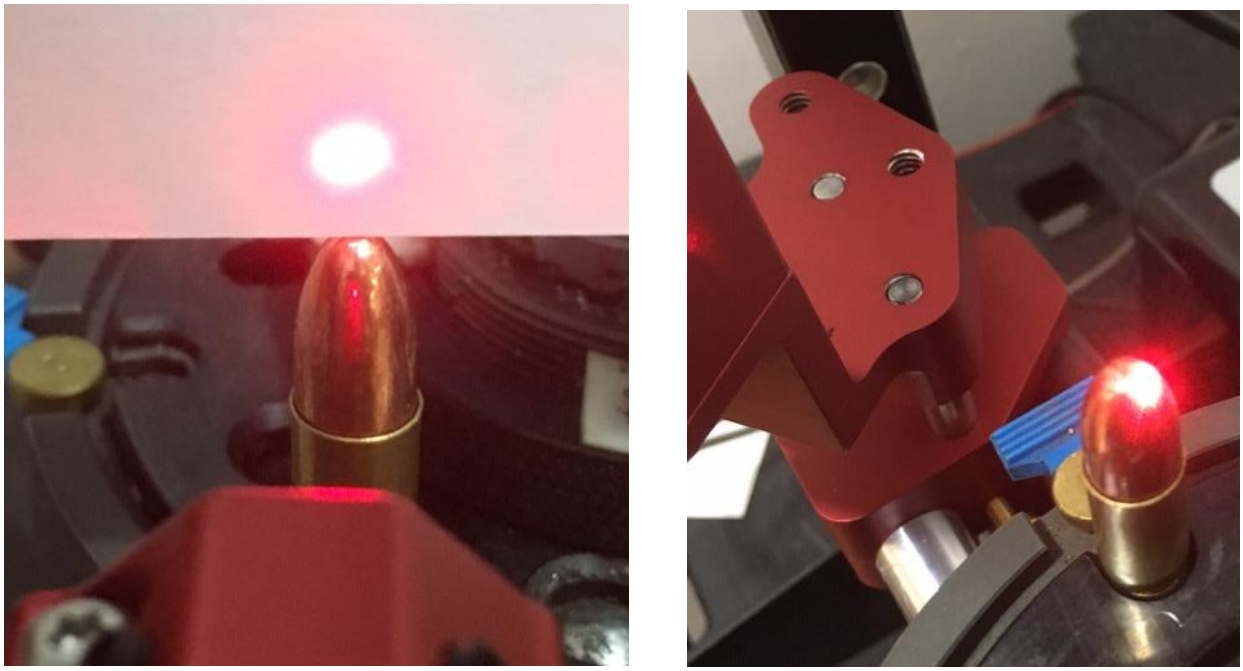


Figure 43: **Beam Over Bullet (Left) the Reflected Beam Will Hit the Back of the Bullet (Right)**

8. When the vertical height is correct a shadow will be cast on the sensor preventing the sensor from “seeing” the laser beam. When the bullet is not present/upside down/ sideways the beam will pass over the bullet and contact the sensor triggering the machine to stop.

9. It may be required to loosen the brass thumbscrew under the sensor head to add a slight angle on the laser body to achieve a proper line of sight between the laser, bullet tip, mirror and back to the sensor hole.

10. Once the proper height and adjustment has been achieved tighten the brass 2X thumb screws located under the sensor head.

11. The sensor head assembly is designed to be rotated out of the way if you need to access the shell plate or perform press maintenance. Use the plastic knob on top of the rod to lift and rotate the sensor away from the machine.

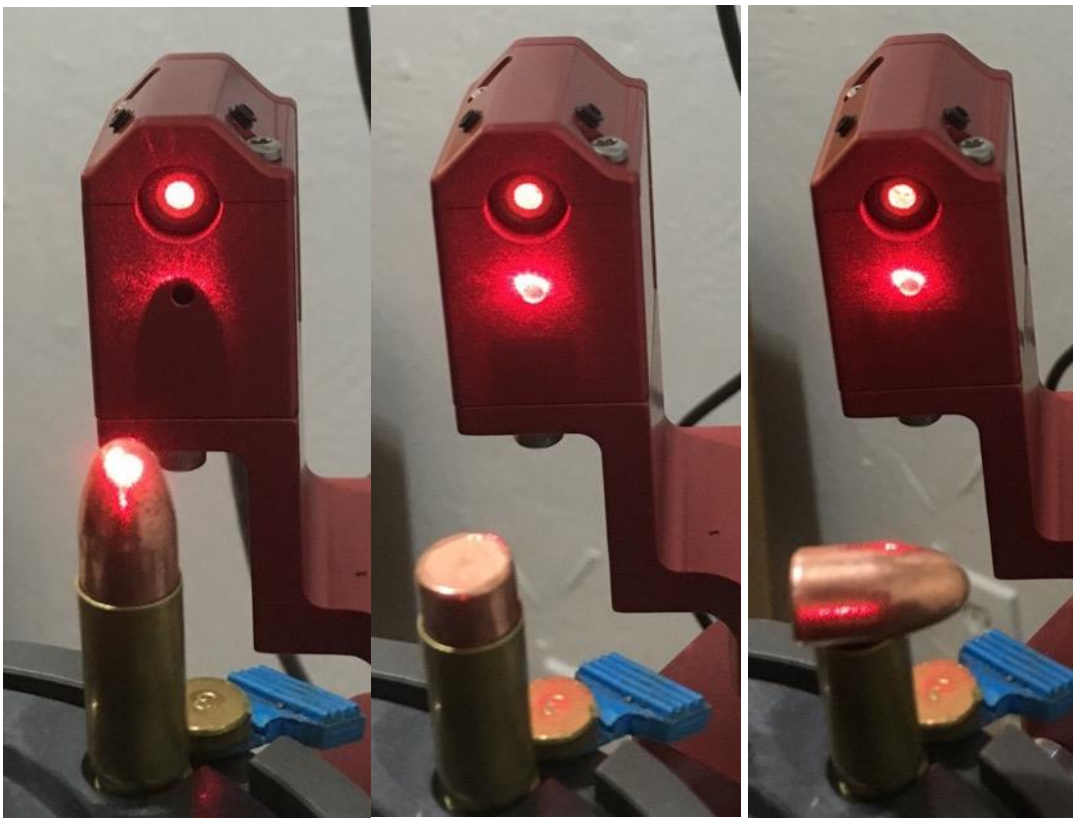


Figure 44: Bullet Properly Oriented - Beam Interrupted (Left)

vs.

Bullets Improperly Oriented – Beam not interrupted (Center and Right)

Operating 650 BulletSense®:

1. With a clear shell plate enter the Reloader application, confirm that you have the required software and firmware version or newer as outlined in the first page of this document.

2. BulletSense® Plugged into I/O Port 3.

3. Confirm that the laser is aligned with the sensor opening.

4. Perform a system calibration then select the sensors tab and make sure BulletSense® is enabled. (See Figure 11).

5. Press RUN or Single Cycle. With a clear shell plate the following notification should appear “Bullet Not Properly Positioned.” (see Figure 12).

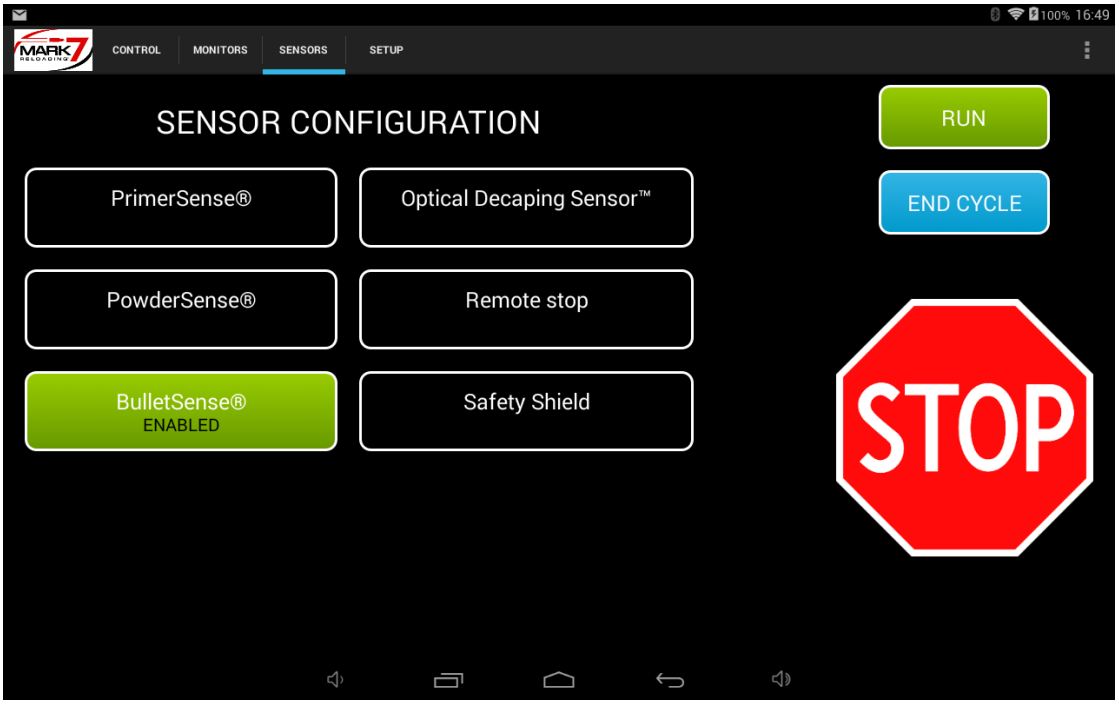


Figure 45: Enabling BulletSense® on Sensor tab

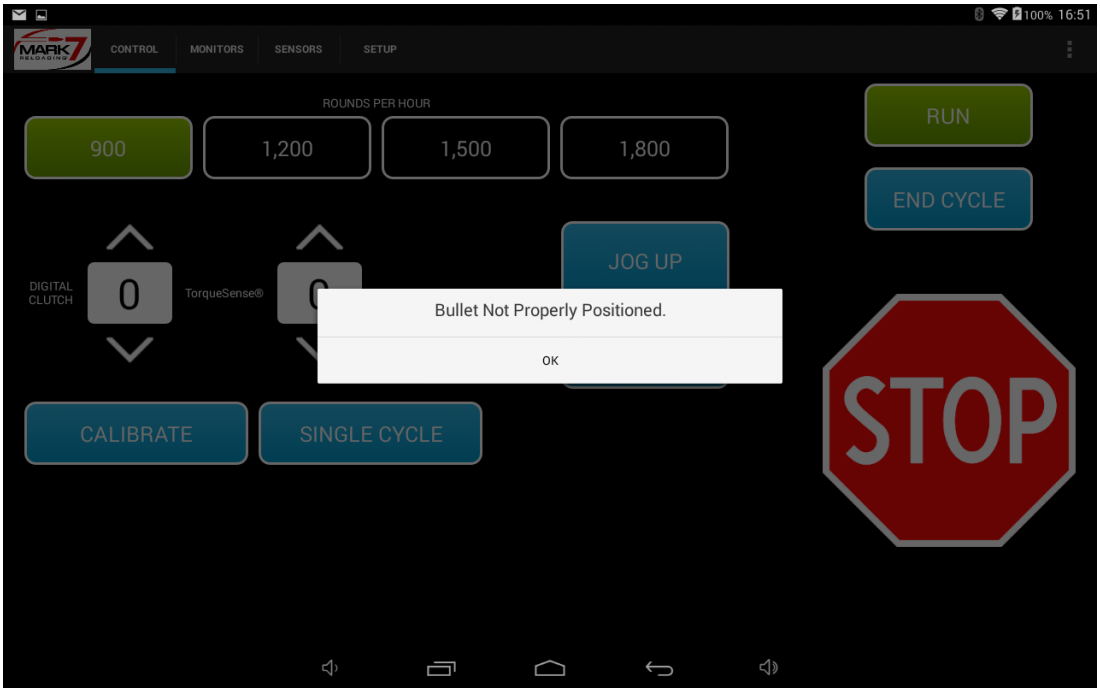


Figure 46: Bullet Not Properly Positioned Notification

Power on the 650 autodrive by turning on the on/off switch on the power console and pressing and holding the tablet power button until the android screen appears. The tablet will automatically launch the Mark 7 Home screen as shown below.

Main Screen

Figure 47: System Home Screen

This home screen contains the Reloader , firmware and software applications. The firmware and Software update applications are only required when updated the system. To check what software and firmware version is installed on your machine enter the reloader application. Before selecting the Reloader application, make sure the console is powered on, all system cables are connected and the shell plate is clear.

Waiver Screen & Software And Firmware Version

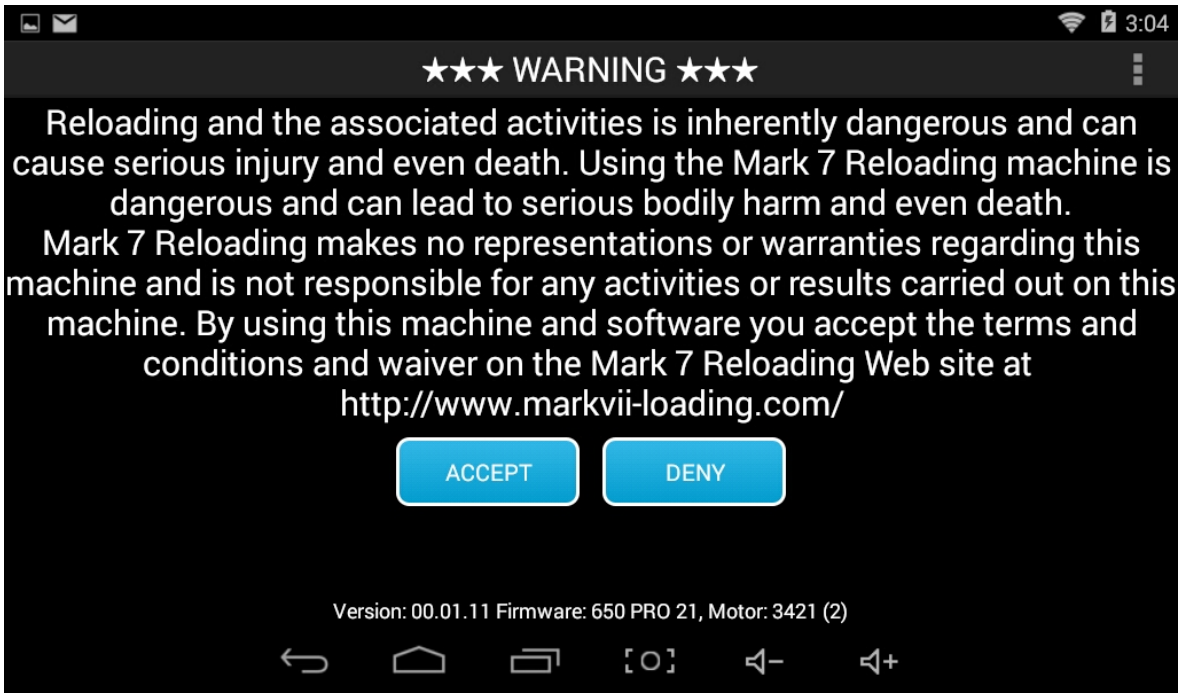


Figure 48: System Waiver Screen (650 PRO)

The waiver screen will appear if all system cables are connected properly. The operator must accept the terms and conditions and waiver on the Mark 7® Reloading website in order to run the machine. If the operator does not accept these terms they must touch DENY which will immediately close the application.

The software and firmware version are displayed at the bottom of the waiver screen as shown above. Check our website to make sure you have the most recent version before you start running the system.

Before Each Session Of The Machine:

WARNING – Before each loading session, fully inspect the machine – this will reduce the errors you may encounter. Some of the items to inspect (for exhaustive list please refer to the Dillon Precision manual) include: Ensure the index ring is not cracked or damaged and that the spring is properly installed. The index plate must be free of debris. Visually inspect all lubrication points. Check the need for lubrication before every session and apply it as necessary at the key lubrication points outlined in the Dillon Precision manual. Insufficient lubrication creates a potentially dangerous situation and may lead to unreliable results as well.

Control Screen

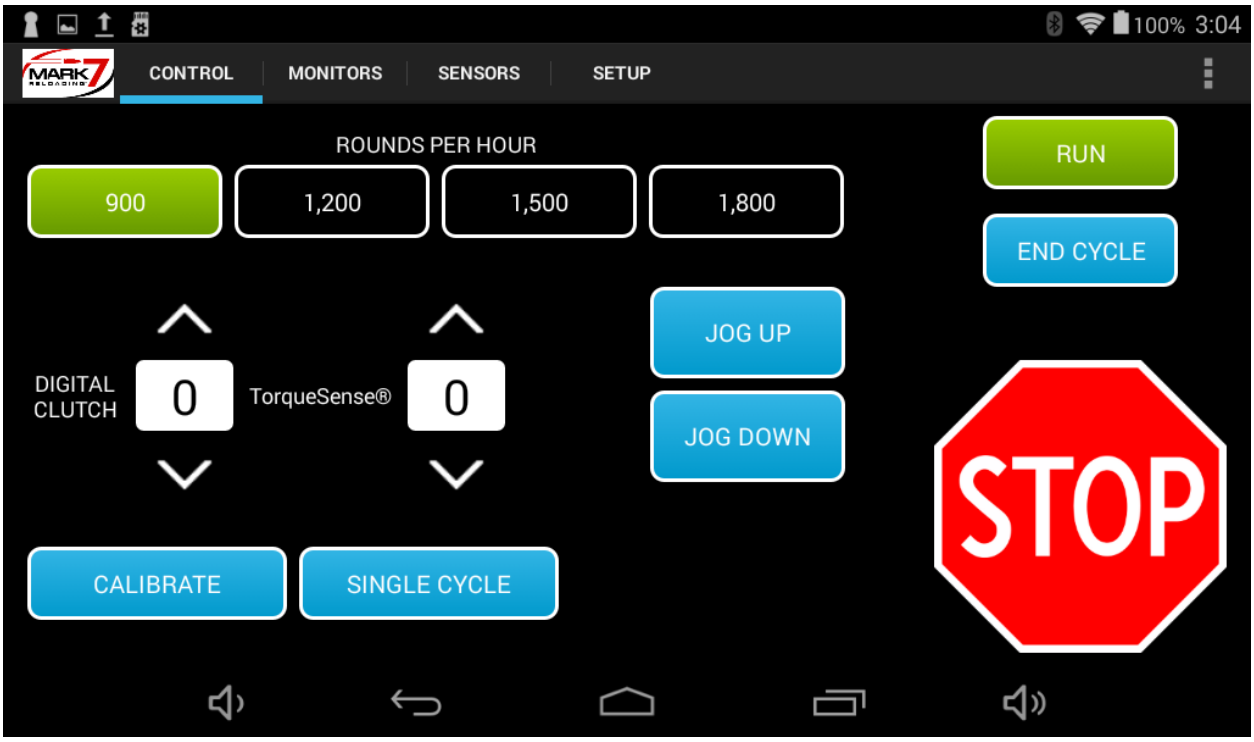


Figure 49: System Control Screen (650 PRO shown)

CALIBRATE - The function is the first operation that must be run before fully running the Mark 7® Autodrive. CALIBRATE signals the Mark 7® Autodrive to find the top and bottom of the machines stroke. Once calibration is completed all Mark 7® Autodrive features can be used. The shell plate must be clear when calibrating. Calibration takes approximately 15 seconds to complete.

DIGITAL CLUTCH - The Digital Clutch setting is the way in which the operator controls the torque output of the motor. We recommend keeping the digital clutch at the lowest level required to complete a desired action, whether it is re-sizing, or making complete ammunition. When the operator hits the torque limit the Mark 7® Autodrive will stop. To continue operations increase the digital clutch value and hit RUN until the cycle is completed.

TORQUESense® Is a variable torque adjustment that lowers the torque below the digital clutch setting during shell plate indexing. We recommend to keep this setting as low as possible. If the value is set too low the machine will stop and notify you with a Torquesense® activated message. Torquesense can be adjusted from 0-5. If you find that you need to increase your torque setting over a value of 2 it's likely that the crank assembly or index assembly on the 650 needs to be serviced.

RUN - The RUN function signals the Mark 7® Autodrive to begin operation at the settings requested.

ROUNDS PER HOUR – The 650 X has 2 speeds 900 and 1200. The 650 PRO has 4 speeds 900, 1200, 1500 and 1800.

SINGLE CYCLE - The SINGLE CYCLE function allows the operator to run a single cycle. This command will only work when the press is stopped and in the top position.

END CYCLE - The END CYCLE function will complete the current cycle and return to the top position.

JOG UP - The JOG UP function will incrementally move the press upwards. The JOG UP functions is useful in clearing jams that may occur. The JOG UP function will only work when the Mark 7® Autodrive is at a stop.

JOG DOWN - The JOG DOWN function will incrementally move the press downwards. The JOG DOWN function will only work when the Mark 7® Autodrive is at a stop.

STOP - The STOP function will stop the press from moving in any event. Pressing STOP twice will switch the motor into neutral which is helpful if the press needs to be manually actuated.

Monitors Screen

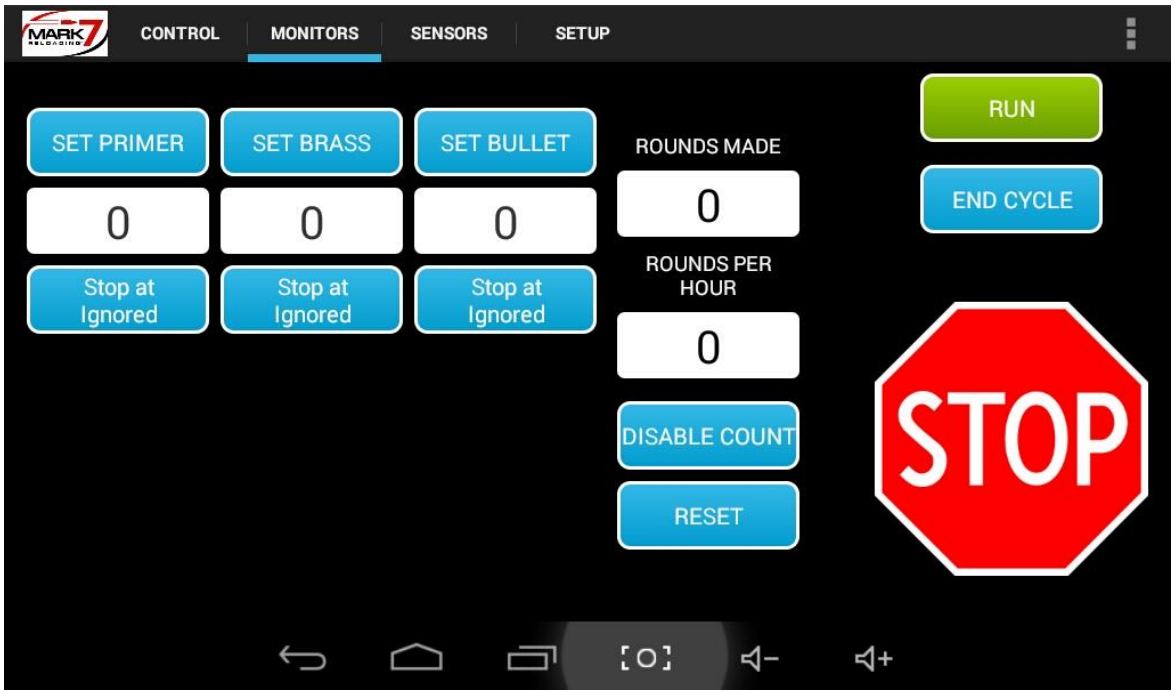


Figure 50: System Monitor Screen

SET PRIMER - The operator has the ability to set the number of primers used before the Mark 7® Autodrive ends its current run.

SET BRASS - The operator has the ability to set the number of brass used before the Mark 7® Autodrive ends its current run.

SET BULLET - The operator has the ability to set the number of bullets used before the Mark 7® Autodrive ends its current run.

DISABLE COUNT - The DISABLE COUNT function gives the operator the ability to not count the amount of rounds made.

RESET - the RESET function allows the user to reset the ROUNDS MADE and ROUNDS PER HOUR fields.

The icons at the bottom of the screen either state – STOP at XX or Stop at Ignored. If the latter, the machine will not stop – the monitor is not in use. If the former, the value that you set is the value that the machine will stop on. If you set primers to 100 and the stop at value of 10, then the machine will stop when it has reached 10 primers left (a value of 90 rounds made).

RUN, END CYCLE, and STOP functions have the same functionality on the Monitors Screen as they do on the Control Screen.

Sensors

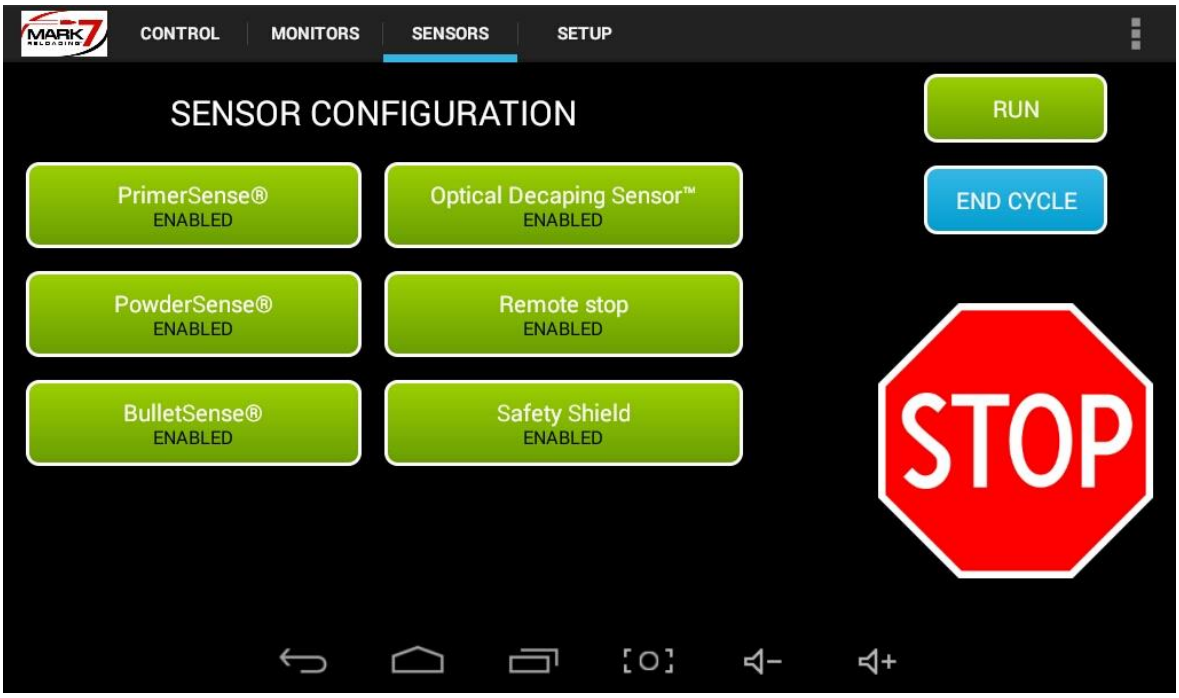


Figure 51: Sensors Screen

On the sensors page all optional sensors can be enabled or disabled at any point during machine operation. We recommend disabling any of the sensors you don't have installed on your system.

RUN, END CYCLE, and **STOP** functions have the same functionality on the Setup Screen as they do on the Control Screen and the Monitors Screen

Setup Screen

Figure 52: System Setup screen

INDEX SPEED - The INDEX SPEED function allows the operator the ability to incrementally reduce the index speed of the shell plate. The higher the value in the INDEX SPEED field the slower the shell plate will index.

TOP SLOW DOWN - Enabling TOP SLOW DOWN will slow down the drive at the beginning of the return stork to minimize case jump when the case exits the powder funnel neck expander. The top slow down speed is tied into the index speed setting. We recommend this setting if you are using a Double Alpha powder funnel for pistol calibers.

TOP DWELL - The TOP DWELL function allows the operator the ability to increase the time in which the press remains at the Top of the stroke. The higher the value in the TOP DWELL field the longer the press will pause.

PRIMER DEPTH – This setting allows you to adjust the primer seating depth and the swage if using the SWAGE it accessory, there are 50 Increments 0-50, 0 being maximum depth, 50 being minimum. We recommend you to gauge your brass when using this setting and be-careful not to back it off too much. There are have been different versions of the 650 primer punch over the years, if you have an older version you will need to increase the primer depth setting to achieve a proper primer depth.

WARNING – Always use caution when adjusting the Primer depth setting. If adjustments are needed only use the single cycle command and adjust in small increments. We do not recommend using Federal primers on the XL 650.

MOVE TO TOP and MOVE TO BOTTOM – These commands will drive the platform assembly to the top position and to the bottom position. This is helpful for setting up dies in the tool head and checking the primer punch and or swage-it rod engagement into the shell plate. These commands will only run from the HOME position. Return from the TOP or BOTTOM position by pressing end cycle.

RUN, END CYCLE, and STOP functions have the same functionality on the Setup Screen as they do on the Control Screen and the Monitors Screen

Software and Firmware Update Instructions

1. Download the latest software/firmware from the support section of our website. Installation instructions specific to the update will be included in the downloaded file. These are general update instructions.

1. Unzip the downloaded file and make sure your file manager doesn't change the name of the zipped files or file extensions. This sometimes happens if the same file is downloaded twice or multiple times. Confirm the downloaded files read exactly as shown below:

   Firmware: __Mark7_mot.hex

   Software: Mark7Reloader.apk and Firmup.apk*

   *May only be included in some update packages

2. Inset the Micro SD card into the SD card adapter that was provided with the Mark 7® Autodrive and load the downloaded .hex and .apk file(s) onto the SD card via a SD card reader.

3. Remove the micro SD card from the SD adapter and insert it into the back of the tablet. Make sure the SD is inserted in the orientation shown below with the text facing out.

Figure 53: Orientation of Micro SD card

4. Power on the tablet and the Mark 7® console and clear shell plate; make sure all system cables are fully connected as in normal operation.

5. Select SOFTWARE UPDATE on the main screen then press INSTALL and DONE after the installation is finished. Depending on the software release there may be more than

one software application to install. The additional file will automatically launch after the first file is finished.

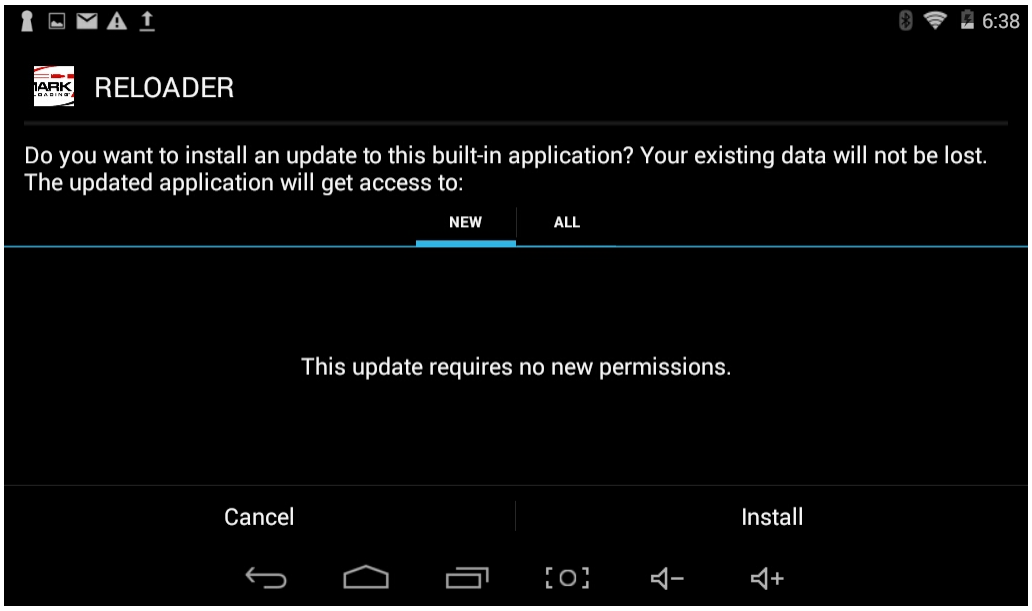


Figure 54: Software installation Screen

6. Once the software has been updated return to the main screen select FIRMWARE UPDATE, then press UPLOAD and press CLOSE when complete. Select the Reloader application and confirm that software version and firmware at the waiver screen is the same as what was just installed.

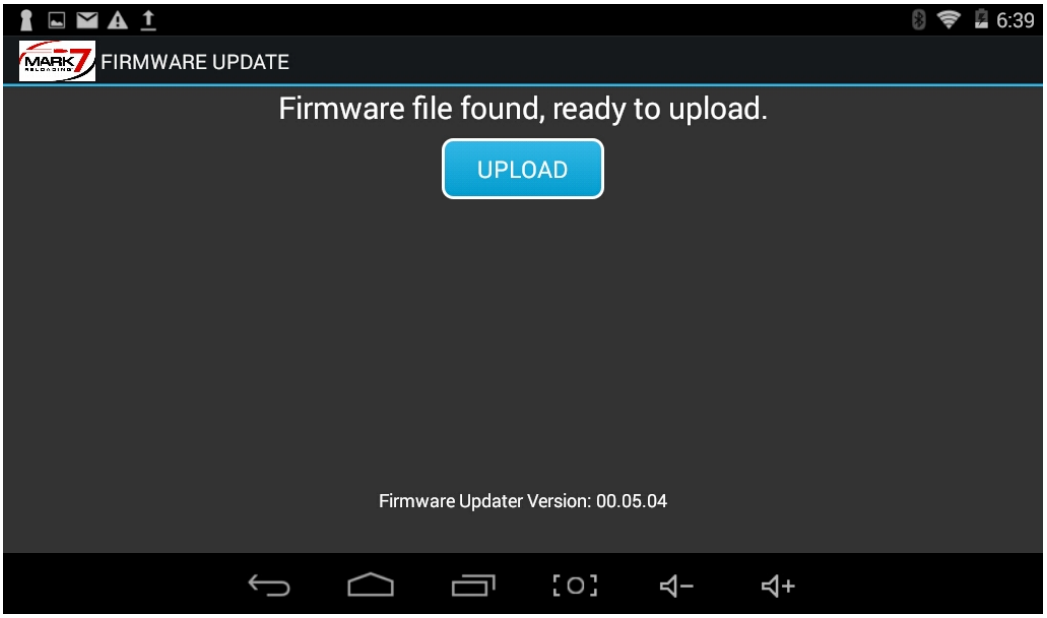


Figure 55: Firmware installation Process

Troubleshooting: software and firmware updates

Selecting Firmware update flashes a black screen then goes back to the main screen.

Make sure the Mark 7® console is powered on and the USB cable is connected between the tablet and console.

Upgrading the firmware takes longer than 5 seconds or freezes.

If the firmware installation hangs up, power off the tablet, power off the console then power back on both the tablet and console are try again

Selecting Software and or firmware update says "Insert TF Card" or no "firmware file on card"

Make sure the .hex file and .apk file copied correctly on the SD card. If the file extension or file name changed this error message will be displayed.

The following Google notification box displays during the software update

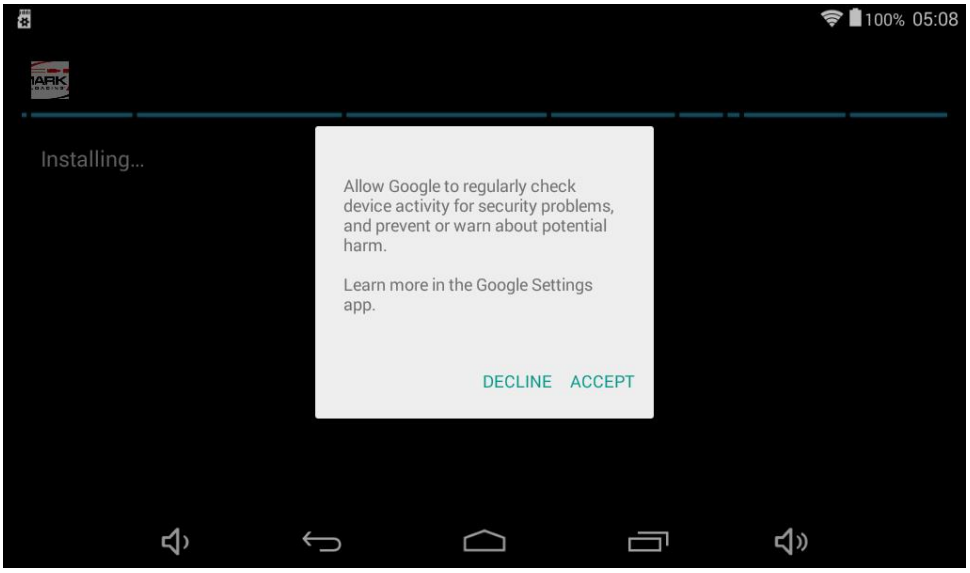


Figure 56: Google notification

If you have enabled Wi-Fi on your tablet the above message will appear. Select Accept and continue with the installation. Note: enabling wifi is not necessary for machine operation or for software updates.

General Maintenance

The crank on the autodrive has 2 roller bearings that should be repacked with grease regularly. Use a syringe to insert grease in the locations shown below. Also re-pack the small pin in the upper crank. When servicing the crank always check all crank screws and set screws for tightness.

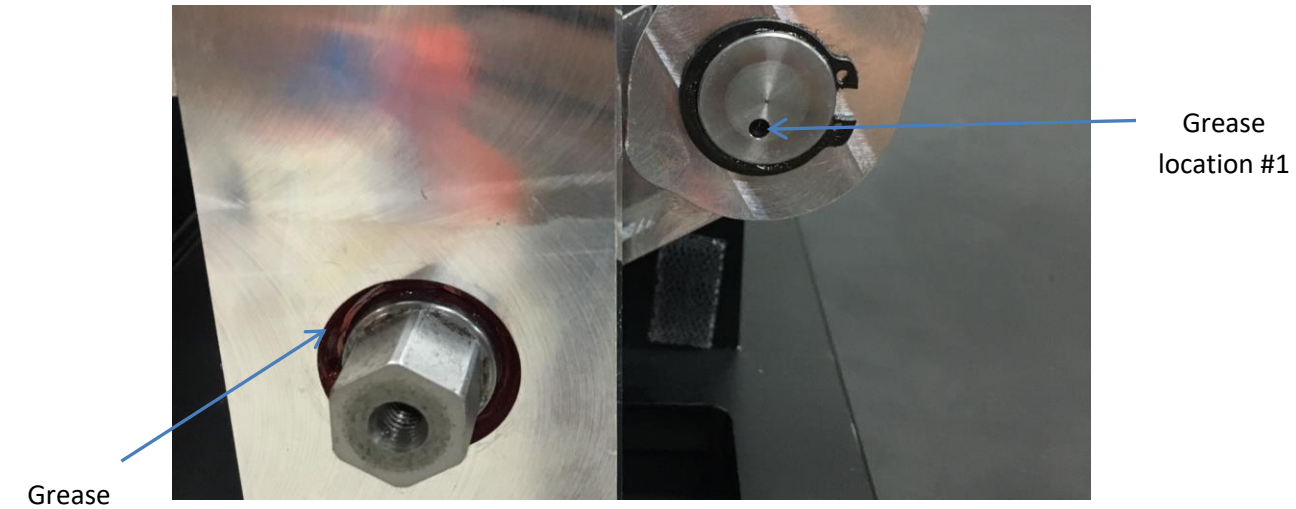


Figure 58: Bearing Grease Points

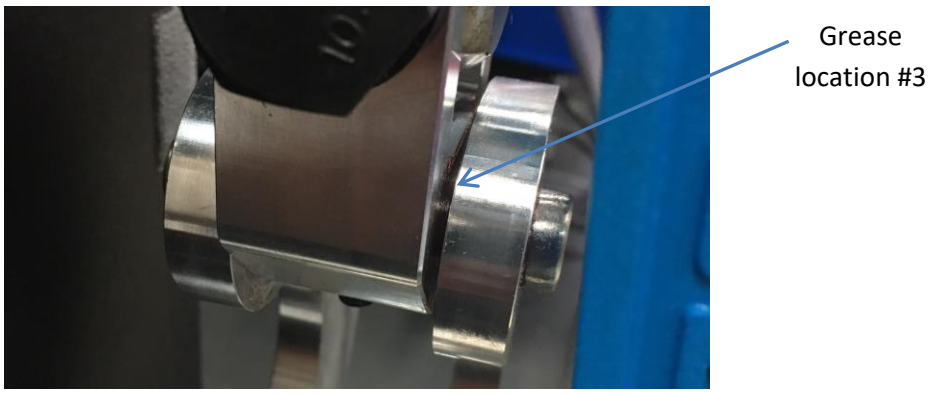


Figure 57: Upper crank grease point

Storage

The following is the proper procedure for storage after a session of use:

1. Ensure that the shell plate is clear of any brass
2. Check the need for lubrication after every session and apply it as necessary at the key lubrication points outlined in the Dillon Precision manual. Insufficient lubrication creates a potentially dangerous situation and may lead to unreliable results
3. Turn off the power to the console of the autodrive
4. Turn off the power to the case feeder and the bullet feeder
5. Turn off the power to the tablet

Ensuring proper system operation

Before using any Mark 7® equipment you must ensure that your Dillon 650 works perfectly in manual mode. This includes proper settings for the type of ammunitions you are reloading at each of the die stations. You must load your perfect ammo in manual mode before installing the Mark 7® Autodrive on your 650.

There is a delicate interaction between the bullet dropper and the amount of brass flair provided by powder funnel. A strategy that may be helpful is to remove the bullet feeder leaving just the bottom portion of the bullet dropper. Loosen the locknut to the powder assembly as well as the two screws holding the bracket in-place under the powder funnel so that you can readily adjust the depth of the powder funnel. Run the machine on slow adjusting both dies until you get the operation you are looking for. You can manually insert bullets into the dropper and single cycle the machine. Make sure that bullets are not toppling over. If so you may need to increase flair and/or increase depth of the dropper mechanism. Once you have run several cycles without issue you can tighten everything up and continue operation.

WARNING – Bullet heads behave differently and in an autodrive setting, small variations in bullet dimensions have unpredictable results in bullet feeding. Take good care that if you are getting results you are not expecting like excessive bullet topple, bullets stuck in the dropper, etc. Check the dimensions of the bullet heads.

Calibration

WARNING – Calibration can only be done when the Mark 7® Autodrive is empty with no casings in the shell plate. Only after calibration is complete you may start reloading ammunition

Test Rounds

Once calibration is completed, and you have loaded the shell plate with brass you must take the first round produced and remove it. Take the next two rounds and check the measurements with high quality calipers. Adjust dies if necessary and repeat to ensure that setting meet the specifications that you are loading.

Digital Clutch Setting

The digital clutch should be set at the lowest possible setting to produce quality ammunition. The Mark 7® Autordrive is shipped with the digital clutch set at 0; this will need to be increased for operation. Settings “1”, “2” or “3” should accommodate the vast majority of pistol calibers. Rifle calibers require higher settings.

WARNING – Never put more than 100 primers in your Dillon press.

WARNING – Please be very careful to not over or under index the machine – double loads and squibs can occur as a result of this situation and it is your responsibility to know when the press has created this situation. An example is: the digital clutch engages at the bottom of the stroke –a primer is already inserted in one case and powder in another. You Jog Up to fix the jam and then activate Run on the press. This would create a potentially dangerous situation. The correct resolution of this is to turn the press off, remove the power. Manually manipulate the press to fix the impacted areas, clear the press, and start the loading process again while discarding the affected rounds.

WARNING – The digital clutch setting will have an effecting change at higher production rates of the Mark 7® Autodrive. For example, loading .40 S&W at 1400 rounds per hour with the digital clutch setting of 4, you may be able to reduce the digital clutch setting to 2 loading at 900 rounds per hour. You should always have the digital clutch setting at the appropriate level for you desired production rate.

JAMSense® - Clearing Jams

There are many types of jams that can occur when operating the Mark 7® Autodrive. Some are obvious and some are not.

Because there are some many types of jams in reloading it is beyond the scope of this manual to cover all types. However, we will cover strategies to employ in clearing jams.

1. When the press stops due to the digital clutch engaging you should first attempt to clear the issue causing the jam and then use the jog buttons to see if you can clear the jam. If you run into a jam where you can’t jog up but can see what has caused the jam press STOP twice, this will put the motor in neutral. The LED on the back of the motor will be a

solid orange in this state. Then proceed to hit jog up, clear the jam and precede operation.

2. Hard jam. If the jog buttons do not move the shell plate then the Mark 7® Autodrive needs to be powered down. Once powered down cut the power and when you are sure that the power is cut
to the Mark 7® Autodrive you may attempt to manually clear the jam. In doing so you must clear the shell plate and confirm that the press can manually index. Run the full cycle of the machine a couple of times by manipulating the belt manually and ensure the machine is in good working order. Then you can repower the machine and continue.

WARNING – Never attempt to clear a jam by placing your fingers in the mechanism of the Mark 7® Autodrive. Always ensure that the Mark 7® Autodrive is off and power is cut off to the Mark 7® Autodrive before attempting to clear a jam.

If you experience a jam or any type of activity that requires you to turn off the Mark 7® Autodrive at the console, you may decide or be required to calibrate the Mark 7® Autodrive again. Always repeat the process of ensuring that the measurements on your brass or ammunition are that same that they were in your previous calibration – they will likely be within acceptable tolerances.

WARNING – Whenever the Mark 7® Autodrive stops due to the clutch engaging and you believe you have cleared the jam always drop the clutch setting down and the speed of the Mark 7® Autodrive down to the lowest level and only run one cycle for safety.

Settings

There are a number of settings that your Mark 7® Autodrive came with. They include: Production rate, digital clutch, dwell, index speed. You can experiment with different settings to ensure that you are making the highest quality ammunition
The icons at the bottom of the screen either state – STOP at XX or Stop at Ignored. If the latter, the machine will not stop – the monitor is not in use. If the former, the value that you set is the value that the machine will stop on. If you set primers to 100 and the stop at value of 10, then the machine will stop when it has reached 10 primers left (a value of 90 rounds made).

WARNING – It is up the user to develop the right kind of settings to support the particular type of operation that they are undertaking.

Communications Errors

If you see the following communication error (USB Disconnected) on the tablet when you are running the machine it is caused by electrical interference or a bad tablet USB connection.

Please follow these steps to minimize electrical interference from external reloading devices that contain motors:

- Check USB connection between tablet and Console is secure
- Install the Mr.Bulletfeeder and Dillon case feeder filter included with the system.
- Route the Dillon power cord and Mr.Bulletfeeder power cables away from tablet USB and power cords. Do not zip tie the Dillon Power cord to the 650 case feeder pole.
- Power the Mr.Bulletfeeder & Dillon case feeder on their own surge protector if possible.
- Make sure the USB connectors are secure and away from the moving 650 components.
- Check your electrical grounds, grounding the machine to an independent true earth ground is recommended.

In the event of this error you must clear the shell plate from all brass, rectify the situation above that caused the error, turn on the machine, proceed with calibration, and restart your operation.

If this error occurs during machine operation and you have followed the above steps please contact us for technical support.

Troubleshooting

Refer to the knowledge base section on our website under **SUPPORT** for troubleshooting articles relating to setup and operation.

http://www.markvii-loading.com/

Please contact us for technical support

Phone: 1-888-MARK77

Hours: 8:30am-5:00pm, ET, M–F

CRM: https://www.markvii-loading.com/crm.asp?action=contactus